Northern California's Computer Magazine

June 8, 1992 • 96

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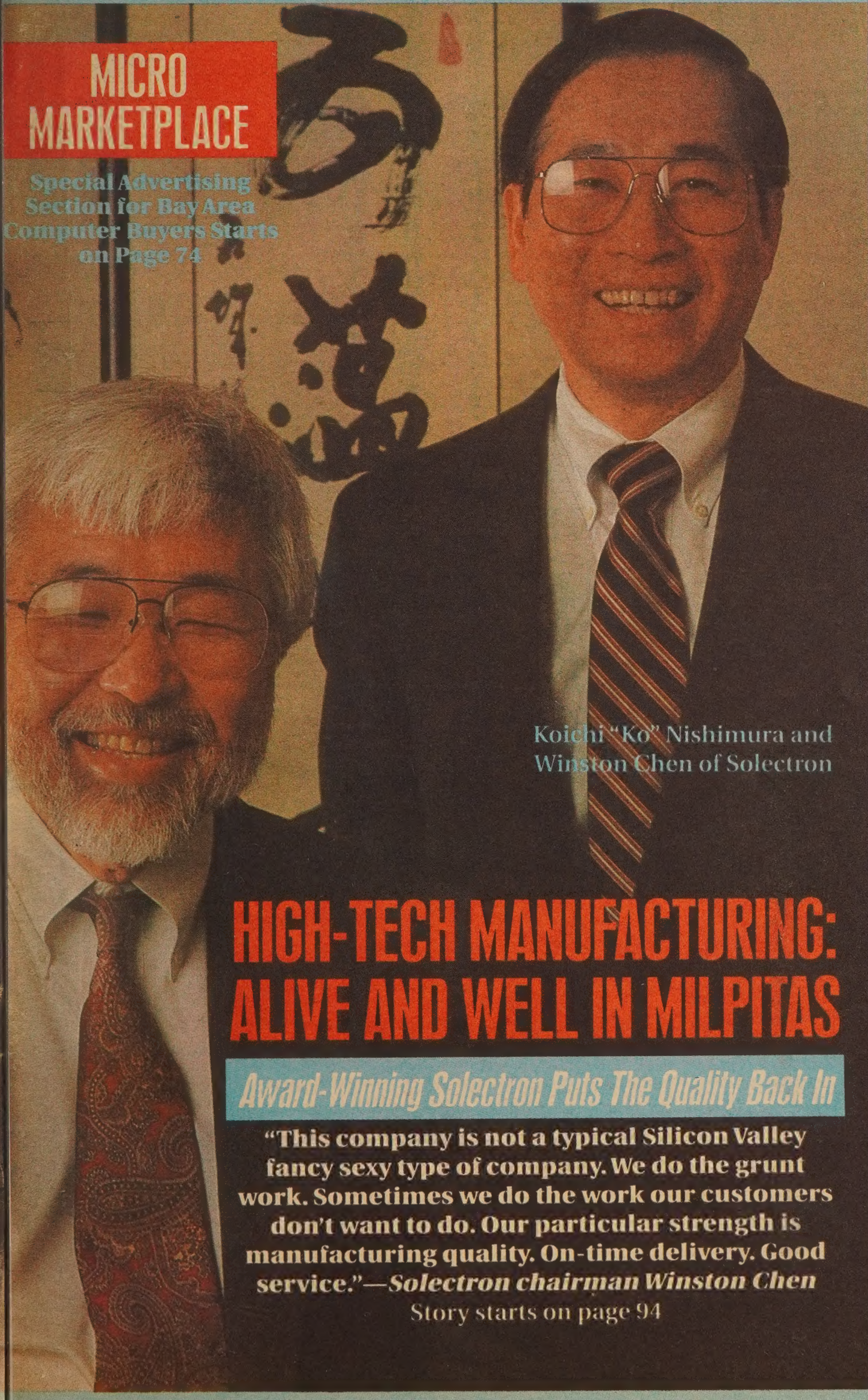

Koichi "Ko" Nishimura and Winston Chen of Solectron

MICRO MARKETPLACE

Special Advertising Section for Bay Area Computer Buyers Starts on Page 74

HIGH-TECH MANUFACTURING: ALIVE AND WELL IN MILPITAS

Award-Winning Solectron Puts The Quality Back In

"This company is not a typical Silicon Valley fancy sexy type of company. We do the grunt work. Sometimes we do the work our customers don't want to do. Our particular strength is manufacturing quality. On-time delivery. Good service."—*Solectron chairman Winston Chen*

Story starts on page 94

OS/2: STILL NOT READY FOR PRIME TIME?

"IBM is treating OS/2 2.0 like a mainframe product: they'll sell it to you, but small users can't get very good service. IBM was primarily thinking about corporate users, who have a computer support and training staff to smooth out the wrinkles for them." Story starts on page 116

OS/2: NOT READY FOR DVORAK?

"IBM has been criticized for its less than stunning marketing in the world of microcomputers. Of course, this is compared to Microsoft, one of the great marketing companies of all time." Story starts on page 266

STATE-OF-THE-ART PHOTO SCANS FROM OFOTO

"Ofoto's Autoscan function 'looks at' the image through the scanner, then determines if it is line art or photo, and what internal settings to use. It's as if your car had not only cruise control, but radio-controlled steering as well."

Story starts on page 196

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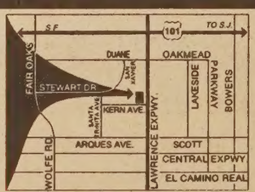

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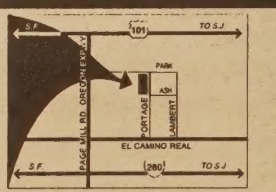

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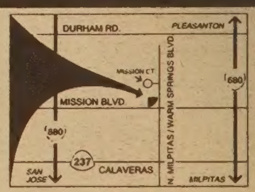

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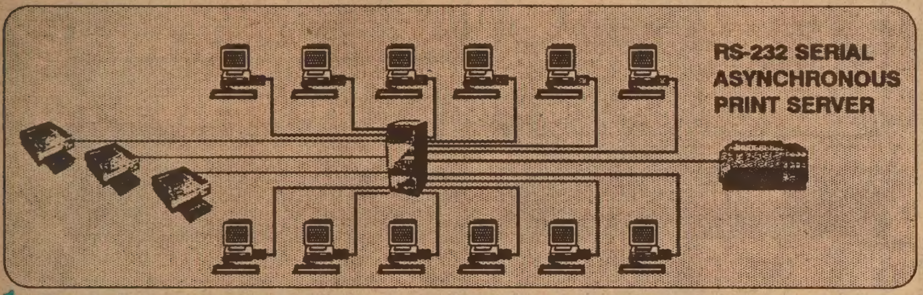
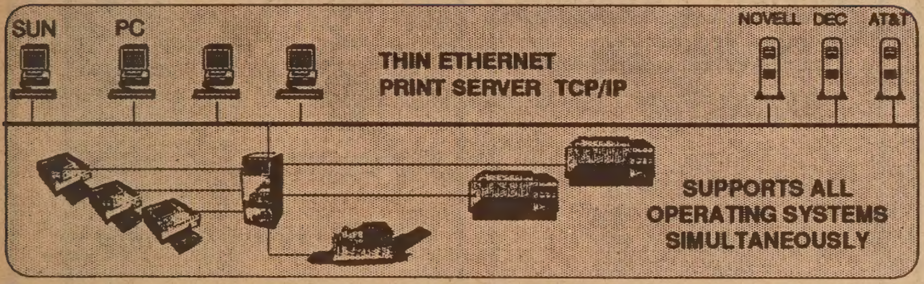


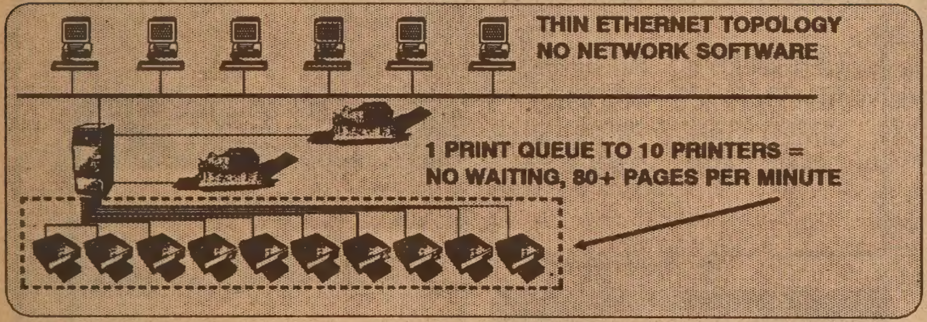
1. The XL-Series as the hub of a printer sharing network. With 10 to 18 ports, two parallel connectors and RJ12 twisted pair connectors for the remainder, this configuration allows you to create a stand-alone network and add stations as required.

XL-100S (10 port): Reg. $1,295, now **$695**, XL-110S (18 port): Reg. $1,595, now **$995**



2. The XL-Series as an Ethernet TCP/IP print server. Connect the unit as one of the nodes on your network and link-up to any one of 10 to 18 printers.

XL-100E-P (10 port, Ethernet, BNC connector, TCP/IP): Reg. $2,495, now **$1,595**


THIN ETHERNET TOPOLOGY
NO NETWORK SOFTWARE
1 PRINT QUEUE TO 10 PRINTERS =
NO WAITING, 80+ PAGES PER MINUTE

3. The XL-Series as a print server or peripheral sharing hub - using thin Etherent cables, but without network software. Ten printers in a class yield 80 pages per minute output - no queues and no waiting.

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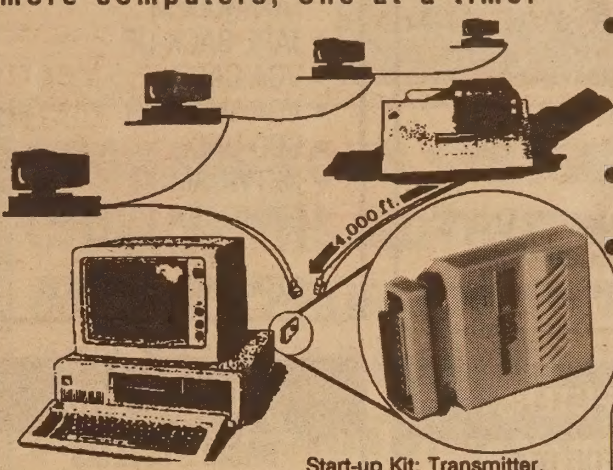

- **No special software - use with current applications (Word, Windows, Ventura, dBASE, 1-2-3, etc.)**
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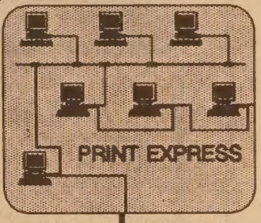

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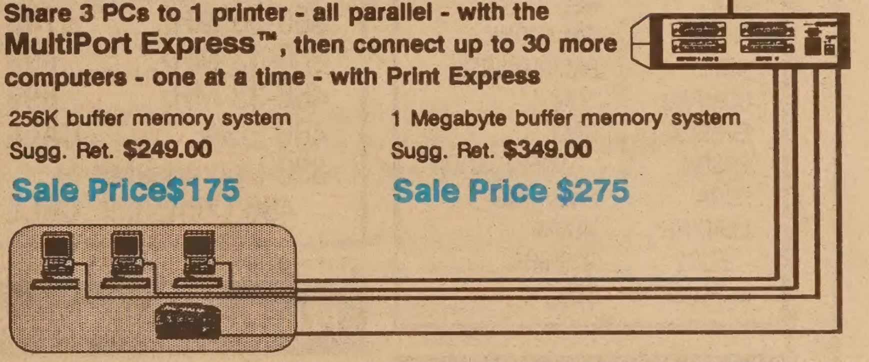

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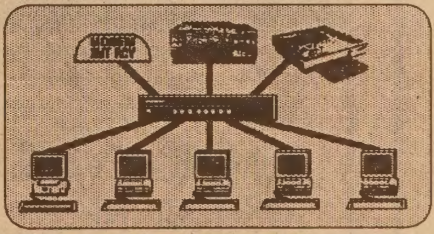

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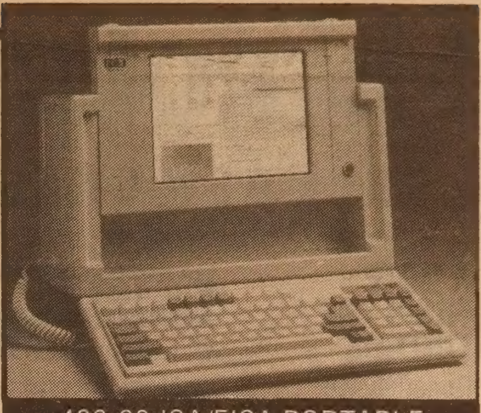

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JUNE 8, 1992 ISSUE #96
MICROTIMES

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A NOTE FROM THE EDITORS

Generally we don't hear too much about the manufacturing side of the computer industry—except frequent complaints about its offshore migration. Quality-obsessed and award-winning Solectron Corp. has been getting a lot of attention lately as a result of its receiving the Malcolm Baldrige award last year, and we thought its chairman Winston Chen had some valuable insights to offer. We hope you agree—the story starts on page 94.

—*ME*

COVER STORY

Quality Is Alive And Well In Milpitas 94
By Mary Eisenhart
Cover photo: Paul Winternitz
Much has been written about the decline of US manufacturing in the high-tech industry, but don't tell it to Solectron. The fourteen-year-old Milpitas-based company makes boards and other components for such clients as Sun, Apple, Hewlett-Packard, and IBM, and has just exported its unique manufacturing style to a new plant in Malaysia.

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Scanners, and why you might really need one.

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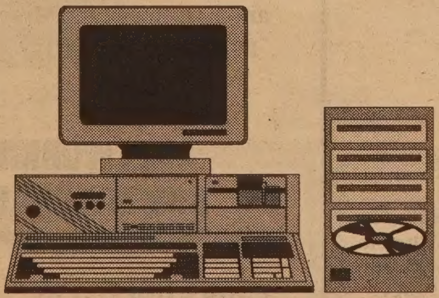

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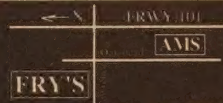

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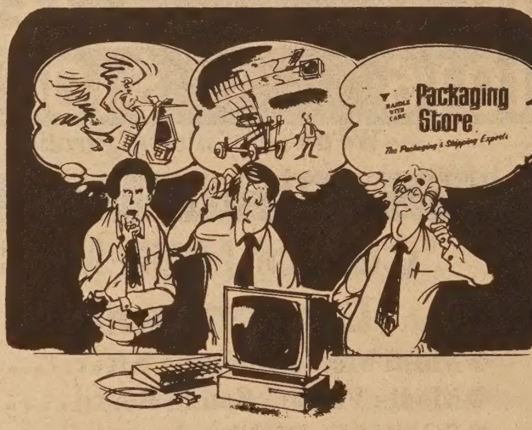

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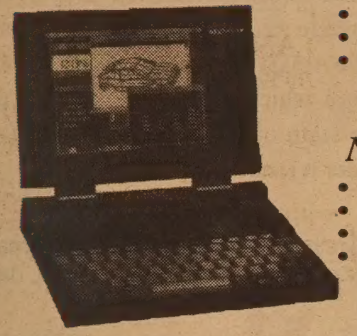

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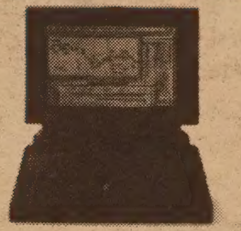

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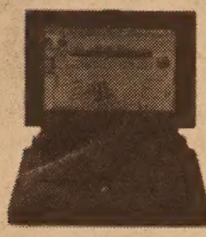

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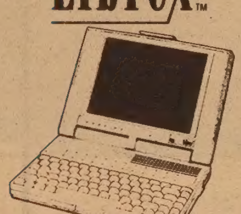

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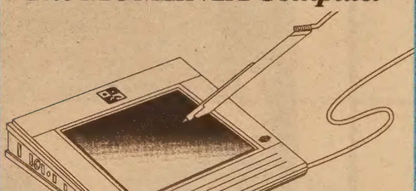

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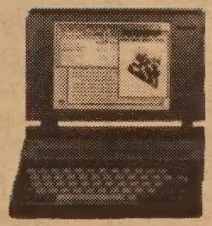

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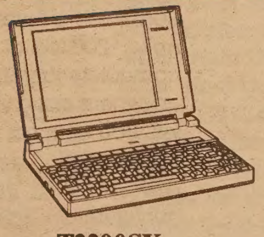

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CONTRIBUTORS

Seven years ago, Matthew Leeds started writing a column for us about Commodore machines. Shortly thereafter, the Amiga came along, Matthew became an early zealot, and his column changed accordingly.

In this month's Guest Editorial, Matthew bids farewell to the Amiga column. We'll let him speak for himself and simply note that we've heard his concerns echoed by a lot of people in the Amiga community.

We hasten to add, however, that we are not going to stop writing about the Amiga. We want to hear from people who are doing interesting things with these machines, whether it's the latest Toaster tricks or some innovative use yet undreamed of. We want to hear from people who want to write about the Amiga. And as the information comes to us, we'll pass it along to you.

We fully recognize that the Amiga community is one of the most ingenious and dedicated groups of people in existence, and we hope to be able to continue to serve that constituency. Clearly the Amiga will survive in some form long into the future—on the inside of Toasters that attach to PCs and Macs, as engines for arcade virtual reality machines, etc. But essentially, the Amiga's future is largely dependent on Commodore, which we hope realizes the potential of its once-state-of-the-art computer and makes it the contender it could have been.

—ME

Sue Albert, who returns to these pages after a long absence, is the proprietor of Suzart Typography & Graphic Design in San Francisco.

Lenny Bailes is a teacher, writer, and consultant who lives and works in San Francisco. His book on memory management is due Real Soon Now.

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Paul Hoffman is an industry analyst who's been writing about microcomputer technology for ten years, and the author of several books on computer-related topics.

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Robert Moskowitz, whose article on wireless networks is his first contribution to *MicroTimes*, is a writer and consultant based in Woodland Hills.

Mike Markowitz has written about games and other interesting subjects for us since our first issue. He works in the computer lab of a major Southern California university, where the questions of new users inspired his "Your First Computer" columns.

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Tony Reveaux is a San Francisco-based consultant, the editor of *Computer Publicity News*. He's also a contributing editor for *Artweek*, and writes the "MediaScan" column in *Film/Tape World.*

Jim Warren, a man of many accomplishments in the computer industry over the years, recently chaired the First Conference on Computers, Freedom & Privacy. He also serves on the board of directors of Autodesk.

Birrell Walsh works at KQED and is interested in a wide variety of PC-related projects.

LAN columnist Wayne A. Yacco is a consultant and writes for many computer publications on a variety of subjects. He lives in Burbank.

Correction

With considerable embarrassment, we apologize to new writer Kimberly Guzeman, whose article on *Silicon Valley Report* appeared last issue, for misspelling her name!

—eds.

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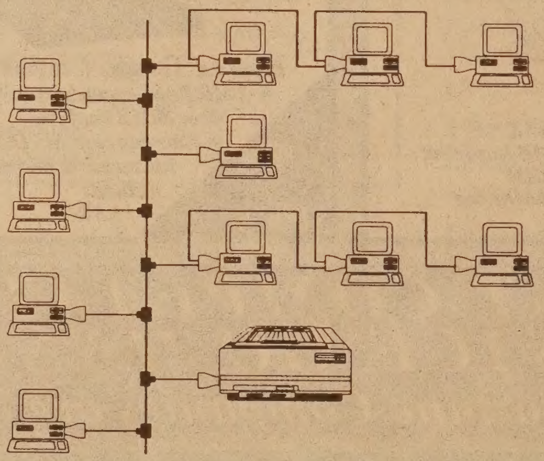

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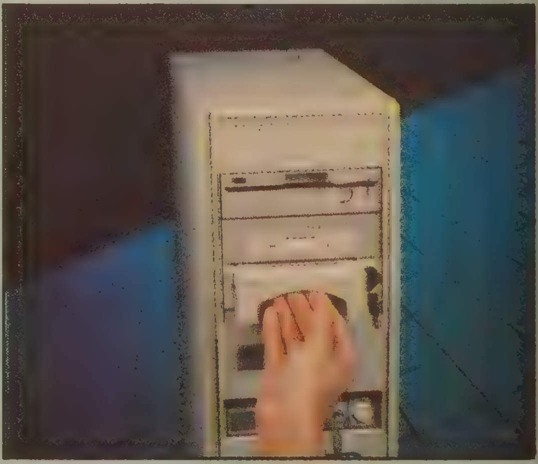

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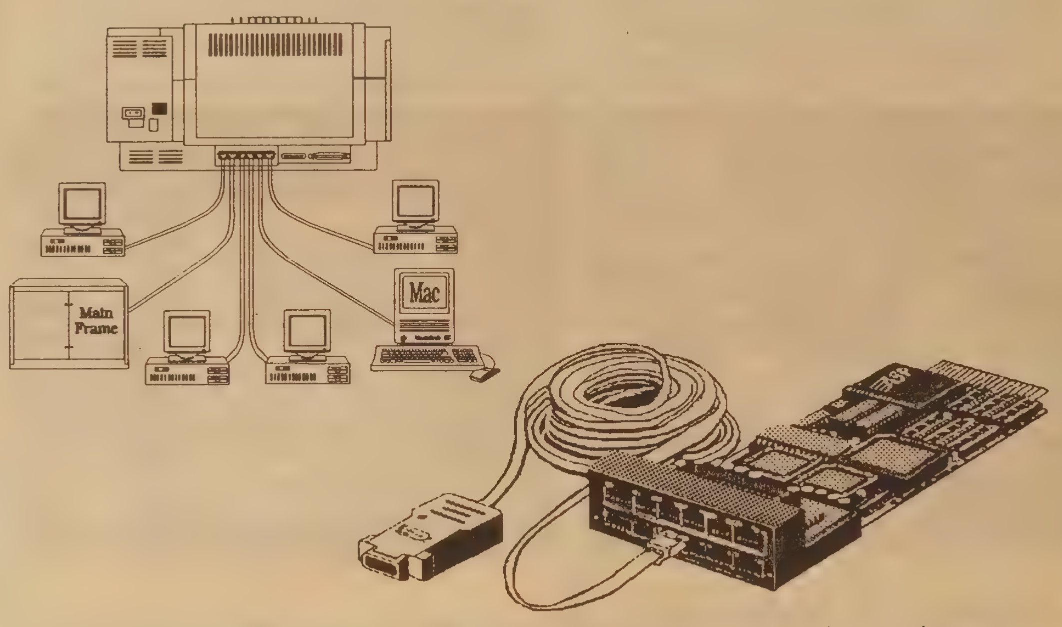

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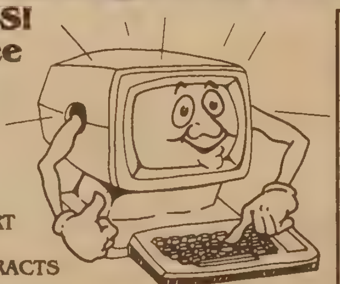

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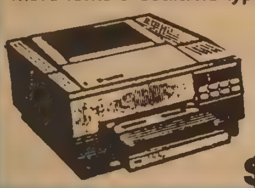

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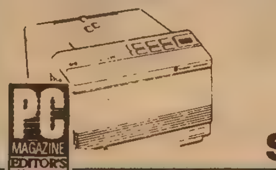

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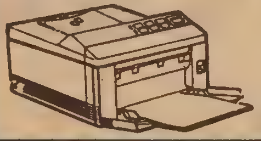

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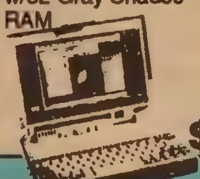

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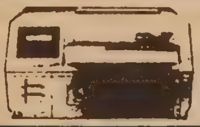

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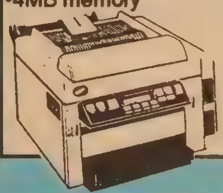

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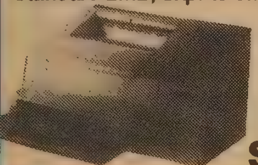

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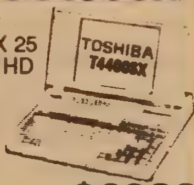

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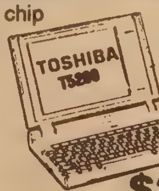

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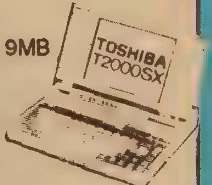

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Letters

THE LITTLE MAC BOOK—ANOTHER SIDE OF THE STORY

(Several months ago, there was much criticism in the media, including MicroTimes, *concerning the fact that Que Corporation had chosen to publish a book by Neil Salkind under the title* The Little Mac Book, *a title already in use for a book by Robin Williams for Peachpit Press.*

The following response comes from Que publisher Lloyd D. Short.)

After recent publicity about *The Little Mac Book,* I have reevaluated an American myth—the myth of the struggle of the "little person" against the giant corporation as representing a cosmic struggle of good versus evil. A myth is a useful teaching tool when the characters are fictional and the lines can be drawn with crystal clarity. But to force the myth to fit reality can be done only by bending and distorting the truth, and doing real damage in the process.

The Macintosh media have been careful not to accuse me of stealing the name of the book, or intentionally harming Robin Williams, or of trying to "ride the coattails" of her success. She, on the other hand, accused me of all three in her open letter to Que.

Yes, Que is the largest computer book publishing company, and that, I suppose, makes some people think of IBM, or Microsoft, or even Apple. But we are a small fraction of the size of any of those companies. When I came to Que, we had forty people including warehouse staff—forty hard-working, dedicated Midwesterners. We weren't very complicated; we believed that if somebody paid for one of our books, he or she had the right to expect readable, accurate, useful information. To make that happen, we worked long, hard hours. If that is a formula, we used the formula to build Que into the biggest and best in the business. And we haven't changed the formula.

We're proud of who we are at Que, and the charge of being "not nice" hurts us. We wonder how a group of people who used to be the most conscientious, hard-working, considerate, and "human" people you could find anywhere could suddenly lose all our humanity simply because we are now the biggest company in the business. We're used to being the best, we're used to being imitated, and we're used to having others ride our coattails. We can't imagine why anyone would accuse us of trying to ride theirs.

Why did I stay with the name *The Little Mac Book* after I knew about Ms. Williams' book? Did my humanity get lost in the pressure of making a business decision? Did the matter seem small to me because duplicate titles are common in publishing? Had I become hardened because of the frequency with which other publishers had imitated Que? Maybe all of those were factors. But as I review my motivation at that time, I find something else. I was offended.

I have a clear memory of an editorial board meeting in 1988 when we were discussing a book we had tentatively titled *The Macintosh Encyclopedia.* Nobody liked the blandness of the title, but no one could think of anything better. At the end of the table, Dave Ewing and I were quietly bantering until one of us said, "Why don't we just call it *The Big Macintosh Book*?" "Or, or... *The Big Mac Book*?" What a great idea, I thought, and blurted it out. Scott Flanders, our president, immediately seized the idea and said, "That's it! That's the title!" Oh, Lord, I thought, what have I done? This isn't Que's image. But then, I thought, this is right for a Mac book, and it's right for this book.

The title became mine. I adopted it. It was important to me. Not long after, I knew that once we had finished *Big Mac,* we would follow with a *Little Mac* companion. It was a natural. It fit. It was right.

Our *Big Mac Book* was published and became immediately successful. It won the Computer Press Association award for the Best Hardware Product-Specific Book of 1989. Sales were strong. We were proud of our success. We began development of a *Little Mac* companion.

Then Peachpit Press took a book that had the title of *Macintosh Basis: An Informal Guide to Using the Macintosh* and published it under the title *The Little Mac Book.* I was astounded. They took my title. Sure, they changed the word Big to Little, and they got their book out before I did. But who are we kidding? That title was mine and they took it.

Those were my thoughts at the time; although I don't know whether anyone at Peachpit did anything knowingly or intentionally. My response was to stick with a name that I believed in my heart belonged to Que and was perfect for our book.

So, where does this leave us? What is the solution behind the emotionalism and the righteous anger? I can understand the need to avoid confusion in the marketplace. A confusion, by the way, that cuts both ways. There is again an assumption, and an unsubstantiated claim, that our sales undermine hers disproportionately to hers undermining ours. Because we are bigger, I suppose. But I have seen no evidence offered of how much her sales are suffering. My reading of the marketplace is that her book is selling very well.

But I am proud of Que's book. It is a book very different from Ms. Williams' book. It has the same cover as *The Big Mac Book,* it has the same trim size and format as our highly successful *Quick Reference* line, and it is a reference book. Ms. Williams' book has a very different cover, a different trim size, and is a tutorial. If my aim was to imitate her, my aim was poor.

My aim was to provide a companion to *The Big Mac Book,* and to link the names. I am

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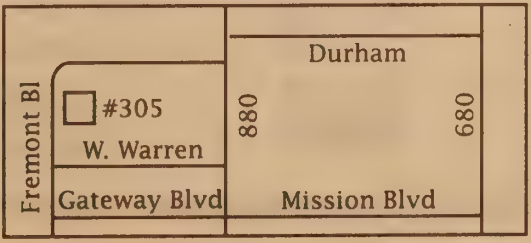

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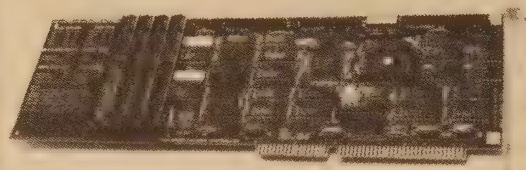

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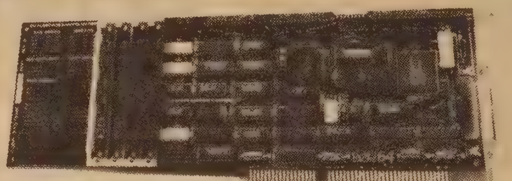

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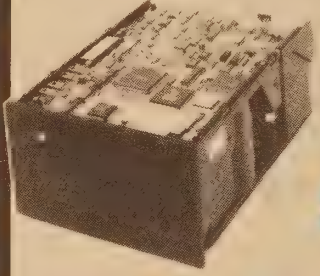

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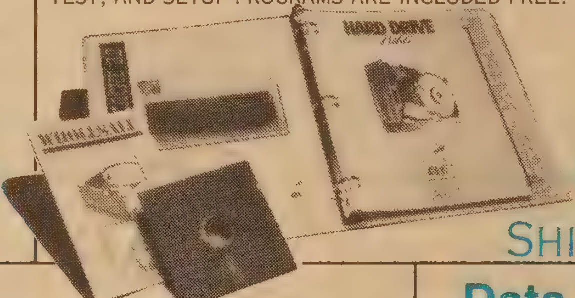

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proud of that link. I am proud of both books. And I am proud of Que's tradition as a provider of good, solid, readable, accurate, useful books.

So, I intend to follow the specific suggestion of many concerned Macintosh end-users. The new editions of both books, to be released in the first quarter of 1992, will be named *Que's Big Mac Book* and *Que's Little Mac Book*. The link will be maintained and the books will be clearly designated as ours, not someone else's. And I wish Robin Williams success with her book. Our books are very different, and any Mac user would be well-served to have both.

Lloyd. J. Short
Publisher, Que
Carmel, IN

WINDOWS 3.1—A READER'S EXPERIENCE

Your publication's article on the pros and cons of upgrading to Windows 3.1 ["Windows 3.1: Boon Or Bane," Issue 95N, May 11] was interesting. I recently upgraded from Windows 3.0 but discovered that 3.1 has some serious drawbacks. As a consequence, I have reverted to 3.0 and have returned 3.1 to the retailer for a refund.

Windows 3.1 was not initially compatible with DR DOS 6.0. Fortunately, the person I talked to at Microsoft mentioned that a "patch" was available from Digital Research. It turns out that a complete upgrade package for Windows 3.1 compatibility was available from Digital Research through their BBS. This upgrade was simple to install and had the added benefit of giving me an additional 5K of available conventional memory. *Thank you, Digital Research.* Windows 3.1 installed without a problem after upgrading DR DOS 6.0. I did not notice any problems or conflicts between Digital Research's memory manager, SuperPC Kwik, SuperStor, and Windows 3.1.

Now for the drawbacks. Before I upgraded to Windows 3.1, I recorded some data while running Windows 3.0: free conventional memory, total available memory, percent resources available, speed and hard drive space available. In all cases, 3.1 did not perform as well as 3.0. Free conventional memory decreased approximately 4K. Total available memory decreased approximately 400K. Percent resources available decreased slightly from 88% to 86%. Throughput speed decreased a nominal amount. Available hard drive space decreased approximately 5MB—in other words, Windows 3.1 required 5MB more hard drive space than Windows 3.0.

The requirement for more hard drive space is interesting. I deleted all Windows files that I will not use, e.g. Terminal, Recorder, Help, certain fonts and text files, etc. I did the same for Windows 3.1, but also deleted the new sound drivers, screen saver, and other files that I will not use. I attempted to have a "lean" version of Windows. Someone might ask why I deleted all the new features of Windows 3.1; well, I simply have no need for them. After all that deletion, I felt that I had a version of Windows 3.1 that had capability equivalent to my earlier 3.0 installation.

"I recently upgraded from Windows 3.0 but discovered that 3.1 has some serious drawbacks. As a consequence, I have reverted to 3.0 and have returned 3.1 to the retailer for a refund."

I have an older, relatively low-capacity hard drive that is pretty full. I cannot justify spending several hundred dollars to upgrade my hard drive to accommodate a $50 Windows upgrade. I believe that Microsoft is letting the low cost of RAM and disk drives be an excuse for inefficient, excessively large programs.

An example is the mouse driver. I am using a mouse driver from 1988 that works just fine, for my purposes, with both versions of Windows. It has a file size of 9K. The mouse driver that comes with Windows 3.1 has a file size of 50K. I understand that the new mouse driver allows me to use the mouse with a DOS program in a window and paste it to a Windows program. Could it be that all this "mouse magic" is a ploy by Microsoft to increase sales of their trackball mouse? After all, it's only $160. (Decisions, decisions—should I buy a new mouse or 3MB of RAM?)

In support of Windows 3.1, the TrueType fonts, especially Courier, are nice, but not at the expense of reduced memory, speed, and disk space.

Daniel J. Spisak
Richmond

AND NOW A MEMO FROM THE DEPARTMENT OF ACCURACY...

I was somewhat taken aback by the "Your First Computer" article in your March 16 issue. Mike Markowitz states, "Baud rate is one part of the rules. 'Baud' is an ugly contraction of 'bits-audio.'" Perhaps the reason that this seems to Mike to be an ugly contraction is that the origin of "Baud" is from the name of the French inventor J.M.E. Baudot (1845–1903). Baud refers to a unit of signaling speed in telegraphic code. Recent usage has changed to apply the term to computer communications rates.

Mr. Markowitz further states that "The earliest modems for personal computers worked at 300 baud, which translates to a data rate slower than most people type." Wow, Mr. Markowitz can really type if he can sustain 300 baud. Even at 10 baud per character (8 data plus start and stop bits) he would still have to type 30 characters per second. I agree that the peak character rate of a typist may exceed 30 characters per second for a very short period. A small amount of buffering, usually two to three characters, takes care of this temporary load.

The problem is that most, if not all, literate people can read much faster than a 300 baud modem can receive!

Charles Krieger
Berkeley

INDUSTRY INSIGHT

ACE's Uncertain Future

BY PAUL HOFFMAN

THE RISE AND FALL OF ACE—MICROSOFT WINS AGAIN

The ACE consortium may fall apart by the end of this year due to lack of interest and the loss of two of its major standardbearers, Compaq and the Santa Cruz Operation.

ACE was founded last year to support a RISC-based alternative to high-end Intel platforms, but it now appears that most customers don't mind relying on Intel and Intel's pricing strategy, especially now that there are many competitors in the Intel-compatible market. Microsoft, meanwhile, has pledged to continue its push to port its forthcoming Windows NT operating system to non-Intel platforms regardless of whether or not ACE succeeds.

The premise when ACE was formed was that large companies like DEC and Compaq needed more leverage in the low end of the workstation market, dominated by Sun with its SPARC architecture. The ACE participants wanted one or two major operating systems running on the MIPS R4000 RISC processors as hedge against Intel CPUs and Microsoft's MS-DOS or IBM's OS/2. The operating systems were to be Windows NT from Microsoft and the popular SCO UNIX from the Santa Cruz Operation.

ACE members assumed that their customers would be clamoring for UNIX-based RISC systems by this year and didn't want them all to go to Sun or be forced to settle for 486-based systems that often seem underpowered. However, there has been no groundswell of interest in these systems.

Compaq has had significant business problems in the past few months. After a corporate shakeup, Compaq is now going to concentrate on the mainstay of its sales, the high end of the PC market. According to Compaq, their departure from the ACE consortium was mainly due to lack of interest from their corporate customers for non-Intel hardware. Given that Intel is widely expected to release faster 486 CPUs and the new 586 CPU later this year, and given that NT will run on these systems (as well as current 386 systems) first, the value of the ACE consortium became moot to many Compaq customers. As long as Microsoft continues to port NT to other platforms, including the R4000 CPU and DEC's newly announced Alpha RISC, customers will be satisfied about possible directions for future growth if Intel doesn't deliver low-cost CPUs.

Compaq cited other reasons for the decision not to manufacture a RISC-based system in the near future. Sun's Solaris operating system will run on both SPARC-based computers and Intel-based computers by the end of this year (although Sun is significantly behind its announced schedule for releasing Solaris); Sun and Compaq could easily sell Compaq computers already loaded with the Solaris operating system and network hardware. UNIX System Laboratories (USL) is aggressively moving into the Intel-based market, as shown by its recent agreement with Novell under which the latter will sell UNIX for the first time. Compaq even said that the availability of NeXT's NeXTStep operating system on Intel-based systems would reduce the need for ACE-compliant computers.

After Compaq's announcement, the Santa Cruz Operation also withdrew, leaving ACE with one operating system instead of two. SCO cited both Compaq's exit and Microsoft's porting of Windows NT to the Alpha CPU as reasons for its departure. It is widely assumed that DEC will stop producing R4000-based systems soon after its Alpha chip is ready. With neither DEC nor Compaq backing ACE-compliant systems, there won't be much of a market for them, and the cost of porting SCO UNIX to the R4000 would be prohibitive un-

Paul Hoffman is an industry analyst who has been covering microcomputer technology for ten years. He can be reached on Internet (phoffman@well) and MCI Mail (264-3171). He also writes popular microcomputer books.

> **Compaq attributed its departure from the ACE consortium to lack of interest in non-Intel hardware from its corporate customers. Since Intel is widely expected to release faster 486 CPUs and the new 586 CPU later this year, and since NT will run on these systems first, the value of the ACE consortium became moot to many Compaq customers.**

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less SCO was guaranteed a large market.

One of the major unstated reasons for many ACE members' growing disenchantment is Silicon Graphics' purchase of MIPS earlier this year. They worry that Silicon Graphics will have too much power over the future of the R4000 CPU, giving SGI an unfair advantage in the ACE market. SGI is growing so fast that it may become a significant contender in the ACE market, something no one was worried about when MIPS was independent.

The winner of the rise and fall of ACE is still clearly Microsoft. Given that Windows NT has been written from the beginning with the intention to port it to different CPUs, Microsoft stands to win whether ACE succeeds or fails. If ACE can stay together and be a force in the industry, all ACE systems will now, by default, run Windows NT. If it fails, Microsoft will probably still make back its investment in porting Windows NT, because companies like SGI will still want the operating system—and may have to spend even more for it if there are fewer players in the field. DEC will probably want Windows NT for both its current R4000 systems and its future Alpha systems, particularly now that it's trying to get a significant share of the PC market.

ACE was founded last year to support a RISC-based alternative to high-end Intel platforms, but it now appears that most customers don't mind relying on Intel and Intel's pricing strategy.

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If you're wishing for the wizardry of DEC VT emulation and networking features combined with the power and ease of Microsoft Windows,* then point yourself toward Persoft's SmarTerm 420 for Windows version 2.0 upgrade. Features include concurrent display of multiple host sessions with color selection, DDE and automatic font resizing. You can 'click' on our keyboard layouts for dBASE IV,* WordPerfect,* and Lotus 1-2-3,* the LK250 keyboard, or define your own keyboard map. User definable button palettes provide a pop-up function key-display you can click on to send the host a pre-defined sequence, a specific keystroke or to invoke a script. On-screen tool box saves time and steps by enabling mouse selection of common tasks like copy, paste, file transfer, 132 column mode and print page. The customizable help system reduces support costs by incorporating answers to frequently asked questions directly in the online help. We fully support the Windows multi-tasking environment. You can perform error-free file transfers in the background, keep an e-mail session, perform All-In-One functions and print—all at the same time! Plus you get LAT, TELNET and FTP at no extra cost. Who's that all-powerful force behind the screen? It's the new SmarTerm 420 for Windows version 2.0. For more information on advanced terminal emulation that's here and now, not somewhere over the rainbow, call 1-800-EMULATE.

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FLASH MEMORY: THE HARD DISK ALTERNATIVE

It took much longer than expected, but Intel and other companies are starting to release "hard disks" that don't have a disk at all, but are made of low-cost flash RAM. Although flash RAM "disks" are still much more expensive per megabyte than traditional drives, their advantages for portable computers are significant.

Intel is the first major company to offer a flash memory card to the general market. The new Series 2 cards are in the small PCMCIA format, about the size of a credit card. Many newer portable PCs have PCMCIA slots, and some companies are developing PCMCIA adapters for desktop PCs. A 20MB Intel flash memory card costs over $600 at wholesale, about three times the price of small hard drives for portables. Other companies will probably follow Intel's lead within the next few months.

Among the advantages of the flash memory cards for portable computers:

•Much higher reliability than hard disks, because they have no moving parts. Many of the repair problems encountered with today's portables are due to hard disk failure; because there are no moving parts, you can safely use a flash memory hard disk even when the computer is vibrating.

•Flash RAM is much lighter per megabyte, so the overall weight of a portable PC is reduced. Depending on the type of hard drive used, this can cut the weight by as much as 20%.

•The cards draw much less power than

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Orchid Pro II's 1M Hi-Color	175
Trident SVGA 1M	75
Oak SVGA 256K	35

KEYBOARDS

Focus 2001/5001	$42/68
Keytronics 101	38
Maxi Switch 101	36
101 Keyboard	30

MONITORS

16″ Sony 1604S	$1025
14″ Sony 1304S	565
15″ NEC 4FG flat screen	769
15″ NEC 3FGX flat screen	669
14″ Sampo Alpha Scan 0.28 (non-interlace)	369
14″ CTX SVGA 0.28 (non-interlace)	320
14″ Arche SVGA 0.28	280
14″ Arche SVGA 0.39	235
14″ Mono Monitor	90
12″ Mono Monitor	75

HARD DRIVES

Conner, Maxtor, Western Digital, Seagate, Quantum, NEC, Fujitsu (ALL SIZES)	CALL

TAPE BACKUP

Colorado DJ20 250 MB	$260
Colorado DJ10 120 MB	195

FLOPPY DRIVES

TEAC 1.2M/1.44M	$60/58
Chinon 1.2M/1.44M	56/54

CASE & POWER SUPPLY

Mini Vertical w/200W P.S.	$70
Med Vertical w/200W P.S.	90
Big Vertical w/230W P.S.	120
Baby AT case w/200W P.S.	70
AT Deluxe case	52
AT 230W/XT 150W P.S.	49/39

MISCELLANEOUS

US Robotics Sportster 96 V.32, V.42BIS MNPS internal	$299
Logitech Mouseman serial/bus	65/75
Zoltrix 96/24 send/receive Fax modem	69
Zoltrix 2400 internal modem w/MNP5	38
Agiler Trackball mouse	29
Agiler Serial mouse	15

CONTROLLERS

Adaptec All Models	CALL
Ultraster All Models	CALL
DTC 7287 RLL	$70
DTC 7280 MFM	60
IDE 2H/4F	38
Multi I/O Plus	16
IDE 2H/2F 2S/1P/1G	25
IDE 2H/2F	16

NETWORK CARD

ARCNET	
8-bit, bus, coax	$59
16-bit, bus, coax	99
8-port Active Hub	155
ETHERNET	
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- ♦ Intel 80486 Processor
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- ♦ 128K Ultra-Fast External Cache
- ♦ 4 MB Memory (Exp. to 64 MB)
- ♦ 1.2 Floppy Drive
- ♦ 1.44 Floppy Drive
- ♦ 170 MB IDE Hard Drive (17ms)
- ♦ 64K Cache Buffer
- ♦ IDE 1:1 H/F controller
- ♦ 2 Serial, 1 Parallel, 1 Game
- ♦ Clock/Calendar
- ♦ Super VGA Card w/1 MB
- ♦ Super VGA Monitor (1024x768 .28 Dot)
- ♦ 101 Enhanced Keyboard
- ♦ Med Size Tower Case w/230 W Power Supply

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486DX-33 MHz w/128K CACHE

- ♦ Intel 80486 Processor
- ♦ 8K Internal Cache
- ♦ 128K Ultra-Fast External Cache
- ♦ 4 MB Memory (Exp. to 64 MB)
- ♦ 1.2 Floppy Drive
- ♦ 1.44 Floppy Drive
- ♦ 120 MB IDE Hard Drive (17ms)
- ♦ 64K Cache Buffer
- ♦ IDE 1:1 H/F controller
- ♦ 2 Serial, 1 Parallel, 1 Game
- ♦ Clock/Calendar
- ♦ Super VGA Card w/1 MB
- ♦ Super VGA Monitor (1024x768 .28 Dot)
- ♦ 101 Enhanced Keyboard
- ♦ Med Size Tower Case w/230 W Power Supply

$1598

386DX-33/40 MHz w/64K CACHE

- ♦ 4 Megabyte Memory (Exp. to 32 MB)
- ♦ 1.2 MB Floppy Drive
- ♦ 1.44 MB Floppy Drive
- ♦ 100 MB IDE Hard Drive (19ms)
- ♦ Super VGA Monitor (1024x768 .28 Dot)
- ♦ Super VGA Card w/1M
- ♦ 1:1 Hard/Floppy IDE Controller
- ♦ Multi-I/O Card
- ♦ Mini-Tower Case w/PS
- ♦ 101 Enhanced Keyboard

$1218
$1228

386SX-25 MHz

- ♦ 1 Megabyte Memory
- ♦ 1.2 MB Floppy Drive
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- ♦ 2 Serial, 1 Parallel, 1 Game Port
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- ♦ 101 Enhanced Keyboard
- ♦ Mini-Tower Case w/Power Supply

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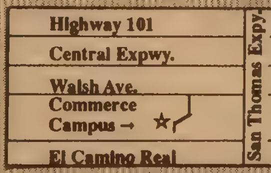

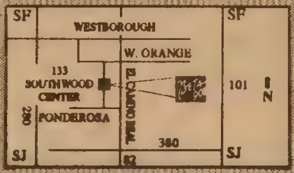

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hard disks, allowing portable PC manufacturers to design their computers around smaller batteries.

•The technology allows manufacturers to design smaller hard disks for systems with little storage requirement.

For example, Intel is also offering 4- and 10MB cards at proportionally lower prices. A portable manufacturer might design a computer with a 10MB card with MS-DOS and WordPerfect preinstalled, leaving about 6MB for documents. For someone who only does word processing, this would be plenty of space, and the computer could be much smaller and lighter than one with a hard disk.

There are still significant disadvantages to flash memory beyond the price. Flash memory takes much more time to erase than hard disks—it may take a few seconds to erase a file. Also, depending on the design of the flash memory chips, erasing or overwriting flash memory is much more wasteful than the same operations on hard disks. The blocks on flash memory disks are much larger. However, good design of the interface to the operating system can minimize the negative effects.

At the same time Intel announced its cards, Microsoft announced an extension to MS-DOS and Windows that handles flash memory cards in a standard, economical fashion. The device driver gives hardware companies a single standard to use so that they can be sure that their flash memory cards will work with future versions of the operating systems. The new Microsoft software also allows developers to write software optimized for flash memory, so it uses the least space and runs as fast as possible.

3.5" DISKETTE SHORTAGE—MORE SOFTWARE UPDATES

Software manufacturers have had a hard time finding 3.5" diskettes lately due to a shortage that may last for at least another six months. Diskette manufacturers have been reporting a large increase in demand for their lower-quality, no-label diskettes since late last year. The crunch got so bad in April that wholesalers of the diskettes were putting customers on allocation.

Diskette manufacturers such as Sony and Maxell are not having any problems with their supply of the commercial diskettes that you buy in stores. These diskettes are of higher quality and sell for much higher prices than the bulk diskettes used for software packages; most diskette manufacturers make sure that the higher-cost diskettes are top priority. Also, there seems to be no shortage of bulk 5.25" diskettes—the market is shrinking and a relatively large backlog has built up.

The main reasons for the shortage of the bulk 3.5" diskettes are a steady shift away from the 5.25" diskette drives in new PCs and more frequent revisions in software packages. As you can see in the advertisements here in *MicroTimes,* most computers are offered with either a 3.5" drive or a choice of 5.25" and 3.5" drives. Dealers that offer a choice between the two sizes say that about 70% of their customers choose the 3.5" drives.

The main reasons for the shortage of the bulk 3.5" diskettes are a steady shift away from the 5.25" diskette drives in new PCs and more frequent revisions in software packages.

The Apple Macintosh has always used the 3.5" drive exclusively, and was the major force for the drive's popularity.

Bulk diskettes became particularly scarce in March and April, as Microsoft and IBM released upgrades to Windows and OS/2. Microsoft shipped over one million copies of Windows v3.1, each with six diskettes; IBM shipped over two hundred thousand copies of OS/2 v2.0 with a whopping twenty-one diskettes per package.

The software market now consists primarily of revisions to existing programs, and many software manufacturers are turning out their revisions more often. The result is a rapid increase in demand for bulk diskettes. Smaller software companies and duplicating services will have to pay higher prices for the diskettes for at least three more months, and some may even be forced to buy premium diskettes at twice the cost of the bulk diskettes in order to get their software out. ■

Technology News From Japan

(Excerpted from the weekly news digest of Japan Marketing Group, 400 Groveland Ave., Suite 312, Minneapolis, MN 55403, 612/871-7889. JMG covers products and events in the Japanese computer industry.)

➤**NTT** has introduced a multimedia database service based on ISDN tecnology. The "Hi CAPTAIN HG" service enables users to combine text, graphic, and image data to create, retrieve, and transmit multimedia documents using PCs. The system uses a UNIX server, supports Ethernet, and offers electronic mail and BBS functions.

➤**NEC** has begun to offer the GEnie online service to subscribers of its PC-VAN telecommunications network. At present GEnie is available only through selected access points, but NEC plans to offer more access to PC networks in the future.

➤Japan's **Computer Software Copyright Association** and the **Business Software Alliance (BSA)** of the US will join forces to protect intellectual property rights and prevent illegal software copying. The Japanese organization is an incorporated body approved by the Agency of Cultural Affairs and has 160 corporate members. As part of the move, BSA will set up an office in Japan as early as this summer. US-made software is enjoying increased market share in Japan, and cooperation between the two associations is expected to increase the effectiveness of the ongoing campaign against illegal copying.

➤**Tomcat Computer** has developed a new board that allows users of PC/AT computers to run applications based on Japan's dominant standard, the NEC PC-9801. Priced at under $800, the board will be marketed by several dealers of AT-compatible machines based on the Intel 80486.

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1024x768 Interlaced VESA Mode 87Hz Refresh Rate
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All front panel Control (Fingertip Display Adjustment) **$283**

ArtView 3e Super VGA **Non-Interlaced Color Monitor**
1024x768 resolution, Non-Interlaced at 60Hz
800x600 resolution, Non-Interlaced at 72Hz
8514/A Flicker Free at Super Mode Maximum Display **$340**
Opti 486 50 MHz w/Intel 486 50 MHz DX2 CPU **$800**
Special Offer 256KB Direct Write Back Cache Memory
Hard Disk: Conner 170 MB HD (16ms Access Time, IDE) **$390**
Maxtor 130 MB HD (16ms Access Time, IDE) **$335**

System Special
FREE MS DOS, MicroSoft Windows 3.1 & Mouse
486 50 MHz SYSTEM $2300

Mini Tower Case w/200W Power Supply
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Intel 486 DX2 50 MHz CPU
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256K External Cache Memory Direct Write Back
4 MB Main Memory Installed
IDE Floppy/Hard Disk Controller
2 Serial, 1 Parallel, 1 Game Port
1.2 MB (5.25") Floppy Drive
1.44 MB (3.5") Floppy Drive
200 MB Hard Disk
Orchid Fahrenheit 1280° Windows Accelerator
w/Hi-Color Sierra S3 Chip, Plus 1 MB video RAM
ArtView 3e Super VGA MultiScan
Non-Interlaced Flicker Free Monitor
MaxiSwitch 101 Enhanced Keyboard

SYSTEM SPEC	286-20	386SX-16	386SX-25	386-25	386-40 w/64K Cache	486SX-25 w/64K Cache	486-33 w/64K Cache	486-33 w/256K Cache	486-50 w/256K Cache
Main Board & CPU	$80	$124	$140	$191	$222	$283	$520	$559	$719
Basic System	$285	$322	$339	$384	$415	$474	$706	$745	$905
Basic System: +40 MB, 14" Mono	$547	$586	$602	$656	$685	$752	$994	$994	$1033
Basic System: +40 MB, 14" VGA	$702	$741	$757	$811	$840	$908	$1150	$1188	$1249
Basic System: +40 MB, (.28) SVGA	$763	$803	$818	$872	$902	$969	$1211	$1250	$1310
Basic System: +80 MB, (.28) SVGA	$829	$869	$884	$938	$968	$1035	$1277	$1316	$1511
Basic System: +105MB, (.28) SVGA	$846	$886	$901	$955	$985	$1052	$1294	$1332	$1528
Basic System: +120MB, (.28) SVGA	$895	$935	$950	$1004	$1034	$1101	$1343	$1382	$1577
Basic System: +170MB, (.28) SVGA	$956	$996	$1011	$1065	$1095	$1162	$1404	$1442	$1638
Basic System: +210MB, (.28) SVGA	$1099	$1139	$1154	$1208	$1238	$1305	$1547	$1585	$1781

Basic System Includes: Mini Tower Case w/200Watt Power Supply, 1:1 IDE Floppy/Hard Disk Controller, 1 MB RAM Memory Installed, 1.2 MB (5.25") or 1.44 MB (3.5") Floppy Drive High Density, 2 Serial, 1 Parallel, 1 Game Ports, 101 Key Enhanced Keyboard.

IBM COMPATIBLE HARDWARE & ACCESSORIES

CASE & POWER SUPPLY

Mini tower case w/200W PS	$64
Mid tower case w/200W PS	104
Big tower case w/230W PS	100
Super tower case w/300W (UL) PS	418
Black color full size tower case w/230W (UL) PS	161
Baby desktop case w/200W PS	75

FLOPPY & HARD DISK

1.2 MB floppy drive	$56
1.44 MB floppy drive	56
40 MB hard disk (17ms, IDE)	193
52 MB hard disk (17ms IDE)	215
85 MB hard disk (17ms, IDE)	275
105 MB hard disk (18ms, IDE)	296
130 MB hard disk (16ms, IDE)	335
170 MB hard disk (16ms, IDE)	390
200 MB hard disk (16ms, IDE)	528
240 MB hard disk (15ms, IDE)	660

MEMORY

1 MB SIMM 70ns	$35
4 MB SIMM 70ns	143

VIDEO CARD

Monographic (Hercules) card w/printer port	$25
16 Bit VGA color graphic card (800x600)	40
AcuMos Windows Accelerator w/512K	63
Trident 8900 Super VGA card w/1 MB	78
Tseng Lab ET4000 Super VGA card w/1 MB	108
Orchid ProDesigner IIs Super VGA card w/1 MB	BEST
Orchid ProFahrenheit 1280 w/1 MB VRAM "Win ACC"	BEST
Diamond SpeedStar Hicolor w/1 MB	BEST
Diamond Stealth HiColor w/1 MB (box)	BEST

MAIN BOARD w/CPU

286 12 MHz	$70
286 16 MHz	76
286 20 MHz	88
386SX 25 MHz	150
286 25 MHz	198
386 40 MHz w/64K Cache	234
486SX 20 MHz w/64K Cache	314
486 33 MHz w/64K Cache	539
486 33 MHz w/256K Cache	579
486 50 MHz w/256K Cache	754
486 33 MHz (Local Bus) w/32 Bit Win Accel Graphic Card	963

MONITOR

14" Flat Screen amber monochrome	$89
ADI 14" VGA color (640x480 .31)	248
Wen Super VGA color (1024x768 .28)	249
ADI MicroScan 2e Super VGA color	292
ADI ArtView 3e Super VGA color non-interlace	330
Nanao 9070U 16" fine silica coating dynamic focus	CALL
Nanao 9080i 16" 1280x1024, microprocessor, invar mask, fine silica coating, dynamic focus	CALL

PRINTER

Panasonic 2133 quiet letter quality (coloropt) 24 pin w/ATM flexibility of Adobe Type Manager & scalable fonts	$267
Panasonic 2124 quiet letter quality (color opt)	CALL
Panasonic KXP-4410 Laser	670
Panasonic KXP-4430 Laser	CALL

MODEM

Zoltrix 2400 baud internal	$51
Zoltrix 94/24 send/receive fax internal modem compatible w/WinFax Pro & BitFax for Windows (send/rec)	78
Zoltrix 96/24 send/rec fax internal modem (MNP5, V.42)	105
Software: BitFax for Windows	45
Zoltrix 9600 baud (V.32 & V.42 MNP5) Internal modem	288

KEYBOARD

Bona 101 keys enhanced	$25
Bona (click) 101 keys enhanced	30
MaxiSwitch 101 keys enhanced	38
Keytronic 101 keys enhanced	45
NTC 101 (Omni Like) click	45
NTC 102 (Function key on left side) click	60

TAPE BACK-UP

Colorado 120 MB	$226
Colorado 250 MB	294

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Computer Stocks Rise Despite Mixed Signals From Economy

Stocks of computer companies, as represented by the Microtimes Stock Index, posted strong returns for the month ended May 8, as investors formulated their strategies to take advantage of economic recovery. For the trading session, our index gained a robust 2.12%, or 75.47, before ending matters at 3642.36.

The discussion on Wall Street now centers not on when economic recovery will happen, but where, and how strong the comeback will be. Investors, however, weren't waiting as they shook off some contradictory signals from the economy and swept stocks higher with a round of buying. Specifically, the Dow Jones Industrials gained 3.50% en route to a closing mark of 3369.41.

One of the reasons for the bullish sentiment was some stronger-than-expected earnings reports, and the companies in our index reflected this trend.

Informix, for example, saw its shares gain 17.24%, or $5.00, en route to a closing price of $34.00. During the month the company announced first-quarter net income of $0.73 a share, up from a loss of $0.16 during the same period a year ago.

Shares in IBM rebounded strongly during the month, as investors were encouraged by many of the moves being made by Big Blue. These included plans to sell computers directly to consumers through mail-order, as well as plans to invest $500 million in Time Warner's entertainment business. For the month, shares in IBM gained $7.13 before ending matters at $93.13.

Motorola led all dollar-gainers during the month, as its stock price climbed $8.00 to end the trading session at $82.13. Investors were encouraged by the firm's announcement of a joint cellular venture with Northern Telecom, which helped push Motorola's shares higher.

On the negative side of both earnings and stock performance were shares in Borland International as a charge against earnings resulted in a fourth-quarter loss of $1.05 per share. This compared unfavorably in investors' minds to the $0.11 per share of earnings that the firm announced for the same period a year ago. For the month, shares in Borland dropped $3.38 before closing at a price of $48.63.

EXCH	COMPANY	TICKER SYMBOL	CLOSING PRICE 04/10/92	CLOSING PRICE 05/08/92	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD	PRICE/ EARNINGS RATIO	ANNUAL DIVIDEND- RATE	YIELD	52 WEEK HIGH	LOW
	SOFTWARE										
OTC	Adobe (L)	ADBE	39.88	46.75	6.88	17.24	21	0.32	0.68	68.50	37.50
OTC	Aldus (L)	ALDC	22.38	22.00	-0.38	-1.68	15	0.00	0.00	54.50	19.00
OTC	Autodesk	ACAD	34.50	34.00	-0.50	-1.45	15	0.48	1.41	62.25	23.25
OTC	Borland	BORL	52.00	48.63	-3.38	-6.49		0.00	0.00	86.75	39.50
OTC	Informix (H)	IFMX	29.00	34.00	5.00	17.24	20	0.00	0.00	36.00	5.25
OTC	Lotus	LOTS	33.25	31.50	-1.75	-5.26	24	0.00	0.00	40.75	18.00
OTC	Microsoft	MSFT	116.00	114.50	-1.50	-1.29	35	0.00	0.00	133.25	60.50
OTC	Novell	NOVL	54.13	52.38	-1.75	-3.23	43	0.00	0.00	65.00	22.63
OTC	Oracle	ORCL	13.25	15.50	2.25	16.98	55	0.00	0.00	21.13	7.00
OTC	Software Publishing	SPCO	18.00	13.50	-4.50	-25.00		0.00	0.00	26.25	12.50
OTC	Symantec	SYMC	43.00	39.50	-3.50	-8.14	53	0.00	0.00	51.00	19.50
	HARDWARE										
OTC	Apple	AAPL	55.50	62.00	6.50	11.71	23	0.48	0.77	70.00	40.25
OTC	AST Research	ASTA	16.25	18.88	2.63	16.15	9	0.00	0.00	32.25	14.50
NYS	Commodore	CBU	13.88	12.13	-1.75	-12.61	8	0.00	0.00	19.25	10.13
NYS	Compaq	CPQ	24.88	25.00	0.13	0.50	35	0.00	0.00	51.25	22.13
NYS	Digital Equipment (L)	DEC	45.25	45.25	0.00	0.00		0.00	0.00	71.75	43.50
OTC	Dell (H)	DELL	25.63	28.00	2.38	9.27	20	0.00	0.00	28.63	13.84
NYS	Hewlett-Packard	HWP	75.00	80.25	5.25	7.00	24	0.80	1.00	85.00	44.63
NYS	IBM	IBM	86.00	93.13	7.13	8.28		4.84	5.20	107.38	81.63
NYS	Silicon Graphics	SGI	18.00	18.00	0.00	0.00	22	0.00	0.00	29.75	13.25
OTC	Sun Microsystems	SUNW	27.75	29.75	2.00	7.21	15	0.00	0.00	37.63	20.75
NYS	Xerox	XRX	72.25	72.25	0.00	0.00	18	3.00	4.15	82.25	51.50
NYS	Tandy	TAN	27.63	28.25	0.63	2.26	13	0.60	2.12	34.38	23.38
	CPUs										
NYS	Advanced Micro Device	AMD	16.63	17.88	1.25	7.52	7	0.00	0.00	21.50	8.38
OTC	Intel	INTC	51.13	53.38	2.25	4.40	14	0.00	0.00	68.75	38.50
NYS	LSI Logic (L)	LSI	7.25	7.13	-0.13	-1.72	48	0.00	0.00	10.75	6.25
OTC	MIPS (L)	MIPS	10.63	9.13	-1.50	-14.12		0.00	0.00	17.63	7.38
NYS	Motorola (H)	MOT	74.13	82.13	8.00	10.79	23	0.76	0.93	83.75	54.00
	COMMUNICATIONS										
NYS	AT&T (H)	T	41.88	43.75	1.88	4.48	93	1.32	3.02	44.38	32.88
NYS	BellSouth Corp.	BLS	44.38	48.88	4.50	10.14	15	2.76	5.65	52.63	43.38
OTC	MCI	MCIC	31.25	32.63	1.38	4.40	16	0.10	0.31	36.13	25.25
NYS	Northern Telecom	NT	44.75	38.00	-6.75	-15.08	18	0.32	0.84	49.25	35.75
NYS	Pacific Telesis	PAC	38.75	42.75	4.00	10.32	16	2.16	5.05	45.00	36.88

KEY: NYS=NEW YORK • ASE=AMERICAN • OTC=OVER THE COUNTER • (H)=NEW HIGH REACHED IN PERIOD • (L)=NEW LOW REACHED IN PERIOD • (s)=STOCK SPLIT

MARKET DIARY:

ADVANCES	18
DECLINES	12
UNCHANGED	3
NEW HIGHS	4
NEW LOWS	5

MOST ACTIVE ISSUES:

LARGEST DOLLAR GAINER	Motorola	$8.00
LARGEST DOLLAR LOSER	Northern Telecom	$-6.75
LARGEST PERCENTAGE GAINER	Adobe,Informix	17.24%
LARGEST PERCENTAGE LOSER	Software Publishing	-25.00

CLOSING QUOTES FOR CHART:

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STANDARD & POOR'S 500 STOCK INDEX	404.29	416.05	11.76	2.91
N.Y.S.E. COMPOSITE	223.27	229.20	5.93	2.66
NASDAQ COMPOSITE	584.24	585.76	1.52	0.26

DATE	MICRO TIMES	DOW JONES
09/27/91	3216.77	3006.04
10/25/91	3223.68	3004.92
12/12/91	3254.85	2895.13
01/20/92	3961.41	3254.03
02/14/92	3984.10	3245.97
03/13/92	3888.19	3235.91
04/10/92	3566.89	3255.37
05/08/92	3642.36	3369.41

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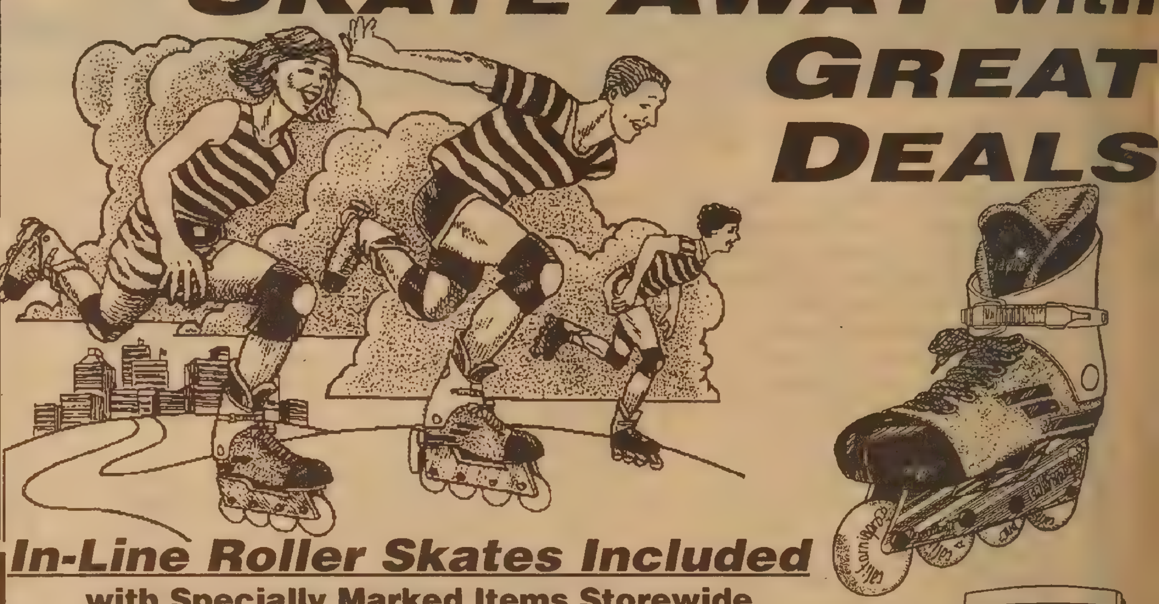

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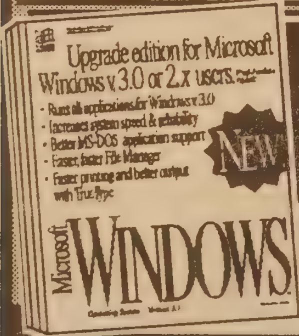

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Flying Exercisers, Digital Hot Rods & Lots More

BY JIM WARREN

REALIZABLE FANTASIES

This column concerns near-future applications and products—viable possibilities within five years or less—"fantasies" only because some innovative technoid or entrepreneur hasn't yet implemented 'em.

EXERCISING COMPUTER SCENES

Len Freedman (Newark, CA) suggests interfacing home exercise machines to home computers—sort of a MIDI interface for thigh-flexers. Then, computer-generated displays could provide bicycle races or ride-by scenery for exercise bikes. Rowing machines could compete with video racing shells. A pedal-powered "airplane" might be implemented by hooking an RPM sensor to the game-port plug that acts like the throttle to Flight Simulator. Warm up your engine, then pedal up into the virtual air.

Maybe we could mix metaphors. How about rowing off the flight deck and steering with the oar-pulls on a rower? Horror-movie fans could hook a stepper-machine to videos of angry demons chasing them—just like childhood nightmares... On second thought, scrub the last idea.

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He organized and chaired the landmark First Conference on Computers, Freedom & Privacy (1991), sponsored by a dozen nonprofit and industry organizations, received one of the first Electronic Frontier Foundation Pioneer Awards (1992), and is a member of the board of directors of Autodesk, Inc.

THROTTLE HACKERS

Half a dozen companies now make "superchips," used to soup up computer-controlled automobile engines by replacing wimp-prone original equipment, according to a November 11 article in *Time* last year. These superchips may increase horsepower by 10%–30% when using high-test gas.

But these prefab chips are for amateur tinkerers. He-manly (and she-womanly) hot-rodders should hack their own engine controls—sorta like milling their own heads or grinding their own crankshafts. So give 'em a fully programmable dashtop computer with an umbilical that'll plug into the engine, replacing the factory computer. Of course, it must either meet the requirements of the Clean Air Act—which now applies to car parts as well as cars—or it'll join the ranks of pirate TV unscramblers and pirate radio stations.

PERMIT VARIETY

Robust software—operating systems, word processors, spreadsheet programs, print utilities, etc.—allows users to set "default preferences." These are the settings that automatically apply every time a program starts up. Unfortunately, many programs currently permit only a single set of defaults.

Preferences are often stored in a single global file—in the application program's home directory or perhaps cluttering up the root-directory or folder. As an appalling alternative, some programs' default-preference settings are modified only by changing the application program itself.

Minimally adequate, modern programs *should* (a) save default settings in separate, named "preferences" files; (b) permit a different preference file for a given application in each subdirectory or folder; and (c) have a "default-default" preferences file in the application's home directory (not in the root directory). When the application is launched, it should first search the current subdirectory for a preferences file, then look in its home directory for the default-default file. If no preferences file is found, it should create the one in the home directory from internal "factory settings."

This year, the FBI wants Congress to pass its "Digital Telephony" bill. It would require all private PBX systems and public phone systems to be equipped so agents' ability to "intercept communications is unimpeded." Nationwide remote wiretaps at the touch of a keyboard.

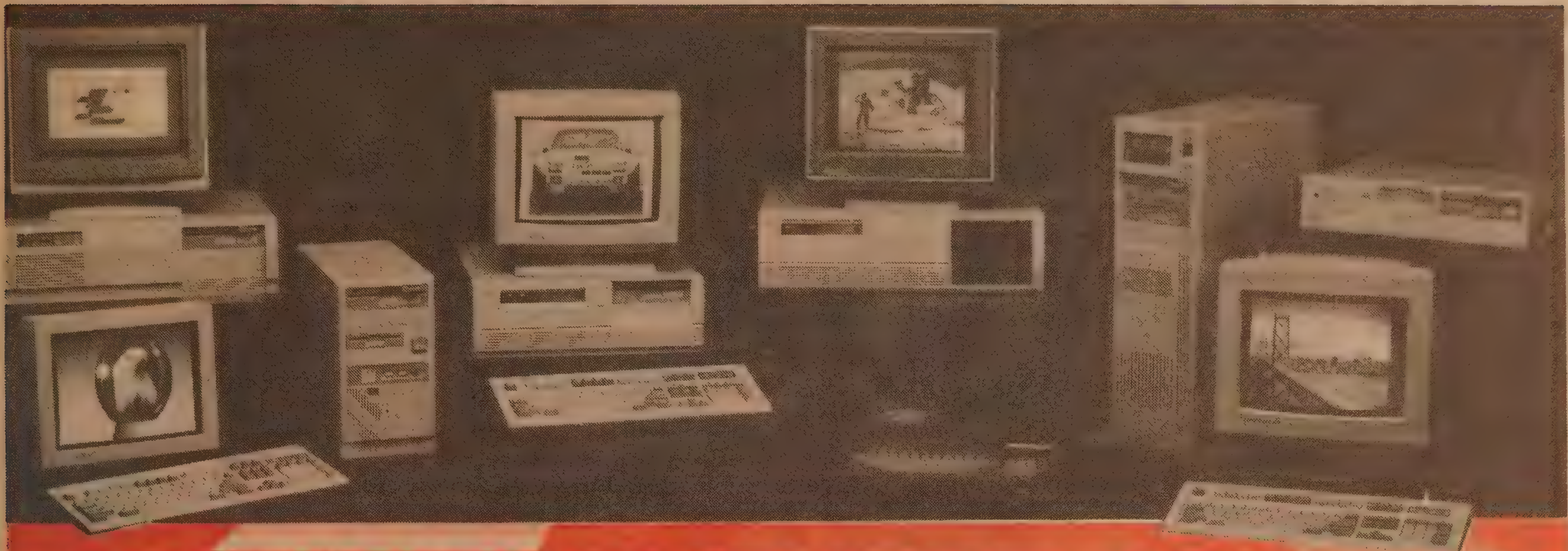
This way, users can have different preferences for different uses of an application. And, of course, users can modify the default-default file in the home directory—at their own risk.

THWARTING COMPUTER INTRUDERS

On all shared/host computer systems, let's automatically encrypt *everything*—or at least all email and data files. I.e., scramble the cracker attractors. Do it at the operating-system or file-system level. Have files unencrypted only when in use by their owners.

Of course, the FBI, IRS, NSA, SS, DEA, INS, office managers, and all the other folks that want to watch what we write wouldn't be real happy about this.

Note: Last year, the FBI was reportedly behind legislation (in SB266) requiring that telecomm companies provide a "back door" to all encrypted traffic so agents could access "the clear text contents of all voice, data, and other communications." Once word of it leaked out,



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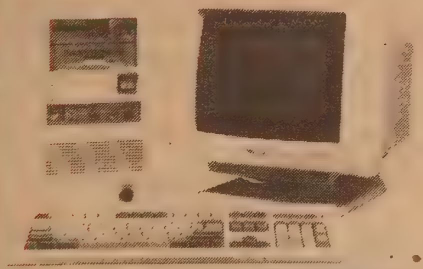

PC SOURCES May 91 Product Review on SPEAR 386/33:
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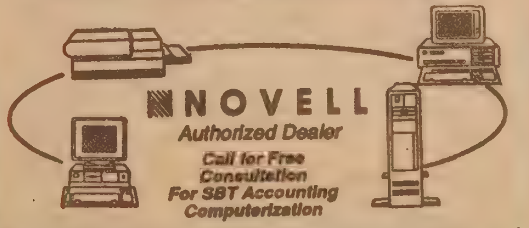
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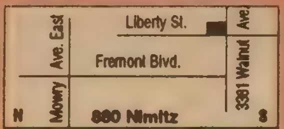

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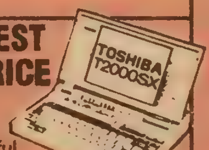

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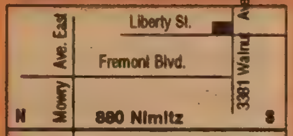

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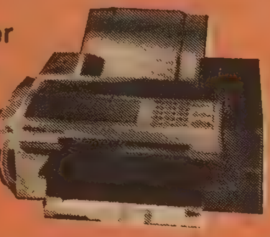

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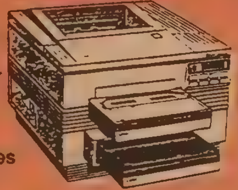

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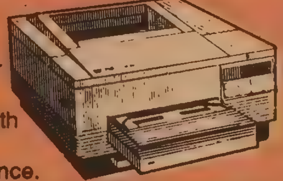

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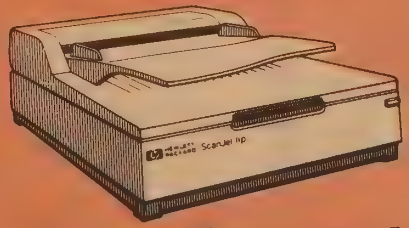

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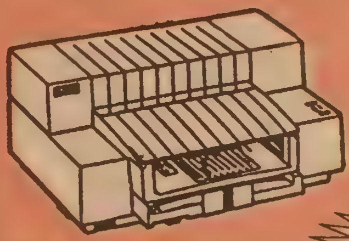

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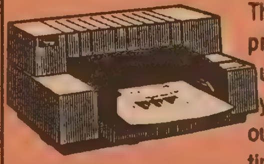

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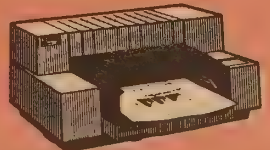

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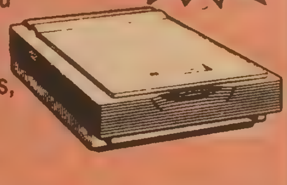

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the legislation was quickly withdrawn.

This year, the FBI wants Congress to pass its "Digital Telephony" bill. It would require all private PBX systems and public phone systems to be equipped so agents' ability to "intercept communications is unimpeded." Nationwide remote wiretaps at the touch of a keyboard. It says telephone rate-payers should pay the costs, and all regulatory hearings about it could be secret—"closed to the public." Of course, agents would only use it *legally*...

You may recall that, for decades, FBI founder J. Edgar Hoover had agents conduct rampant wiretapping to build dossiers on his political opponents and anyone else who interested him.

QUICKIES

•Wireless networking is one of the hottest areas for entrepreneurial and technology development for at least the next half decade. It allows computers to communicate by radio transmission rather than wires. It's applicable to all networking environments, LANs (local-area networks; probably pricey but useful), WANs (wide-area networks), and "MANs" (metropolitan-area networks; an illustrative term used by wireless designer Dewayne Hendricks of the also-illustratively named Tetherless Access, Ltd., Fremont, CA).

Wireless datacomm will really start moving, now that the WARC (World Administrative Radio Conference) has allocated significant radio spectrum for digital communications. Let's just make sure that big players like Motorola and IBM don't monopolize that spectrum.

•Robert Harrington (Ann Arbor, MI) wanted to pass around copies of my March column, but noticed that it was copyrighted with all rights reserved. OK, restrictions now lifted for nonprofit use.

•Know of any shoddy government work—that is, illegally shoddy? Modem the details to the Whistle Blower's BBS run by Rep. Robert Wise (D-WV) at (202)225-5527, 8-N-1, 300/1200/2400.

•Is it true that the new experimental fighter that crashed in May did so due to computer malfunction?

•It *is* true that the General Accounting Office singled out software deficiencies as "a major reason for the delay and increased cost" of the C-17 transport plane. It's two years behind schedule and $1,500,000,000 over budget. That is, the cost overruns *alone* on this new military toy are twice the estimates for rebuilding the six thousand-or-so malls, stores, and homes destroyed in the LA riots. The DOD says they need the new—nonfunctional—C-17 because their old transports are wearing out. Isn't it strange how new aircraft can't be built from those old, tried-and-proven designs?

•And, did you hear about the used Lisa disk drive that was for sale in April at a Silicon Valley store? The one that had a SCIF label on it? SCIF stands for "Sensitive, Compartmented Information Facility"—one o' them hypersecret government facilities.

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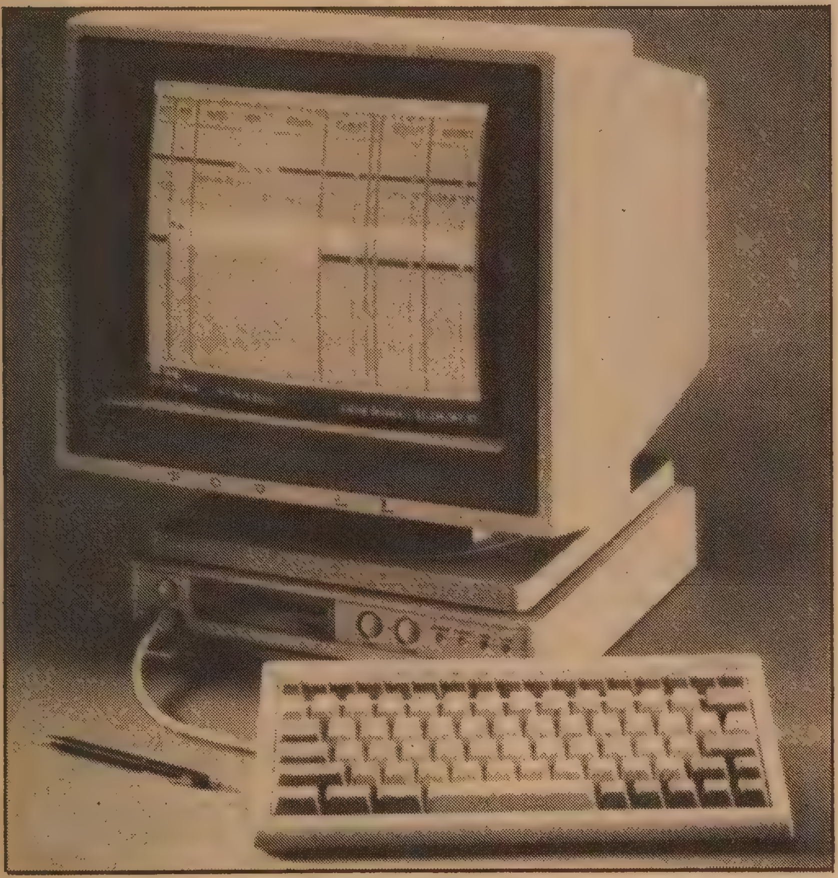

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Matthew's Farewell To The Amiga

A Great Machine In Search Of A Great Company

BY MATTHEW LEEDS

AMIGA

Those of you who read the entire magazine may have noticed that in the last year or two I've been writing more than just this column, and that most of the other writing has not been about the Amiga. Those of you who only read this column, bless you.

This will be my last regular Amiga column. While I've written my columns in the past for my readers, this one's for me. I hope you'll read it.

I'll still be contributing to *MicroTimes*, writing reviews, articles on multimedia, video, new technologies, and other stuff that catches my interest. But after seven years of nonstop coverage of the Amiga (the longest continuous coverage outside of *AmigaWorld*), it's time for me to move on.

THE UNFULFILLED PROMISE

I started writing about the Amiga because it was the most exciting computer available. Priced so that anyone could buy one, with a true multitasking operating system, incredible animation capabilities, lots of color, great sound, and other features considered radical in 1985 when it was released. Over the years I felt privileged to write about new products, new developments, and the future of the Amiga.

I switched careers, from photography to software, hoping to do my part to make the Amiga a success. It was a heady time, traveling across the country to trade shows, meeting with users and other developers, learning all I could about the Amiga and passing that information on to you.

Over the years I began to see a pattern emerge, one that disturbed me. While the Amiga had great potential, that potential seemed buried behind the inept marketing and lack of vision that Commodore brought to the platform. Certainly there were talented engineers working at Commodore, the hardware and operating system were proof of that. But the Amiga never caught on in the general business community—and over time, less and less with consumers as well. While some success occurred in Europe, the North American market withered.

Copyright© 1992. All rights reserved. *Matthew Leeds has been involved in the high-tech field since he blew up his bedroom playing with a children's chemistry kit. He has been using Commodore computers since 1982 and has a strong interest in photography, video, graphics, and related fields.*

I moved from company to company in the Amiga market. None seemed able to make a real go of it. Finally I started working for a software developer who addressed the entire consumer market—MS-DOS, Mac, Amiga, C-64, Apple. Even, for a time, Atari. I had the opportunity to work with other systems, try out other software, learn about other hardware, compare the Amiga to other computers. I learned a lot.

I learned that while the Amiga's operating system is (in my humble opinion) the most powerful available for a consumer system, its power is inaccessible to most users. The very features that provide that power are hard to understand, difficult to master, and not well integrated. I learned that what had been innovative and cutting-edge in 1985 was now passé. Commodore had failed to keep up with its competition.

OTHER PLATFORMS KEPT GETTING BETTER

DOS systems had 256-color VGA displays (with palettes of over two hundred thousand colors) and many had 32,000-color displays. Sound cards for DOS systems equaled and bettered the Amiga's native sound capability. DOS systems came with a hard drive, and the total cost for a 386-based system was less than that of a 68000-based Amiga 2000.

Macintosh systems had fallen in price. They too had a 256-color standard display, with a palette of sixteen million, and could easily be expanded to display that entire range. They had decent built-in sound and hard drives. The operating system, while still not multitasking, had in many ways surpassed the Amiga.

Quite a lot in those worlds caught my attention, but I had to hunt to find worthwhile developments in the Amiga community. At the same time I watched Amiga developers, distributors, and magazines go out of business. The list is long and painful, and the tale has been told before. The number of Amiga developers who could be counted as true successes is small, and most of them diversified with development on other platforms.

I too diversified. I bought a computer that was not an Amiga. I've still got my 3000, but it gets less and less use over time. I'm still waiting for Commodore to set a standard for 24-bit display cards. I'm still waiting for Commodore to figure out how to advertise the Amiga. I'm still waiting for decent, affordable, and reliable networking software. In short, I'm still waiting for the Amiga to be a success.

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And so I too diversified. I bought a computer that was not an Amiga. I've still got my 3000, but it gets less and less use over time. I'm still waiting for Commodore to set a standard for 24-bit display cards. I would not consider buying one unless I felt confident that most of the future software would run on it. I'm still waiting for Commodore to figure out how to advertise the Amiga; perhaps if they do, the installed base will expand sufficiently to encourage more broad-based software development. I'm still waiting for decent, affordable, and reliable networking software for the Amiga, so that it has a chance in the business community. In short, I'm still waiting for the Amiga to be a success.

THANKS AND ANTI-THANKS

I lay the blame for the Amiga's lack of success directly at Commodore's door. Perhaps revolving door would be a more apt description. Since I've been covering the Amiga, the long list of presidents, vice presidents, public relations firms, advertising firms, and assorted marketing flacks that have passed through Commodore is impressive and depressing. The market positioning for the Amiga product line has changed more often than a one-year-old's diaper. The pricing on Amigas has changed more than the hemlines on skirts, and in as many directions. Commodore, get a grip.

There are a lot of people I've got to thank for helping me with my writing career. Roger Tierce and Malcolm Lowe and the rest of the gang from the San Francisco Commodore User's Group for taking me under their collective wing when I was just starting, and for that great run we made at promoting Commodore computers, the West Coast Commodore Association—the first West Coast Commodore-specific trade show promoters. Guy Wright for letting me write for *AmigaWorld*, and Bob Kinney for putting me on staff for a year at *Commodore Magazine*, may it rest in peace. Mary Eisenhart, my editor here, for letting a brash, young know-it-all talk her into a regular column for Commodore computers, and for giving me virtual carte blanche as to content. All the guys that put the First Amiga User's Group together, and brought the spirit and excitement of those early years to so many. The engineers at Commodore who still haven't given up. The developers who created some of the most innovative hardware and software (here's hoping you all get the success you so richly deserve).

The Amiga has made an impact in the video market. A great portion of that success is due to one company, NewTek. For those of you interested in things Toasted, I recommend the *Video Toaster User* magazine, published by Avid Publications. They cover more than just Toaster-related products and do a great job on video and animation as well. I also recommend the *AmigaWorld Special Issue on Video & Animation*. While *AmigaWorld* often misses the mark, this issue is right on the money.

Finally I'd like to thank you for being a great audience for this column over the years. I hope that you've gotten as much enjoyment out of it as I have. ■

The list is long and painful. The number of Amiga developers who could be counted as true successes is small, and most of them diversified with development on other platforms.

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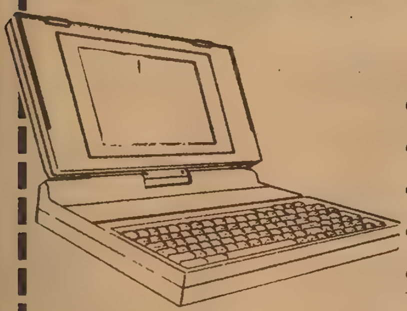

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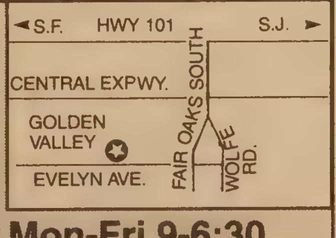

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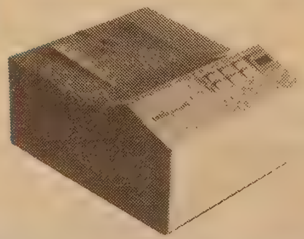

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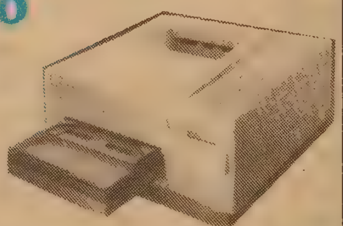

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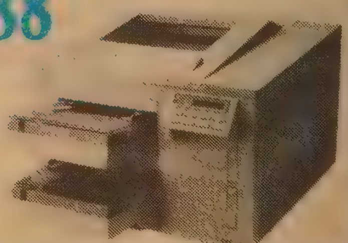

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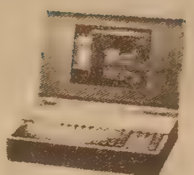

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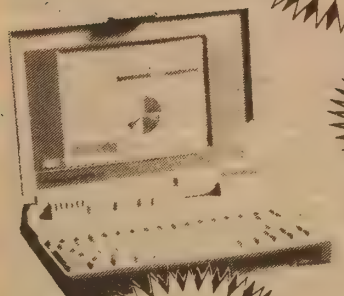

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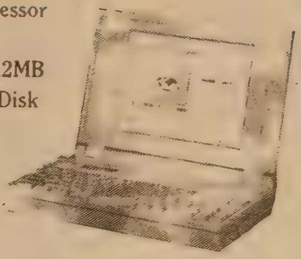

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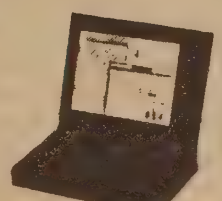

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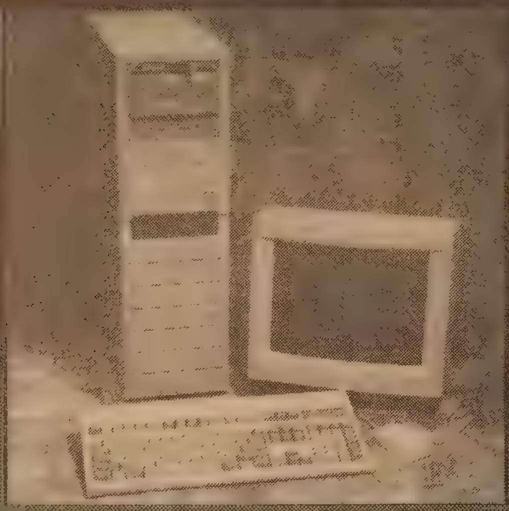

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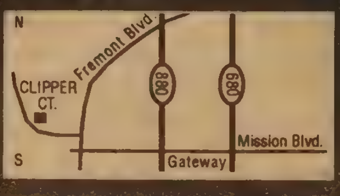

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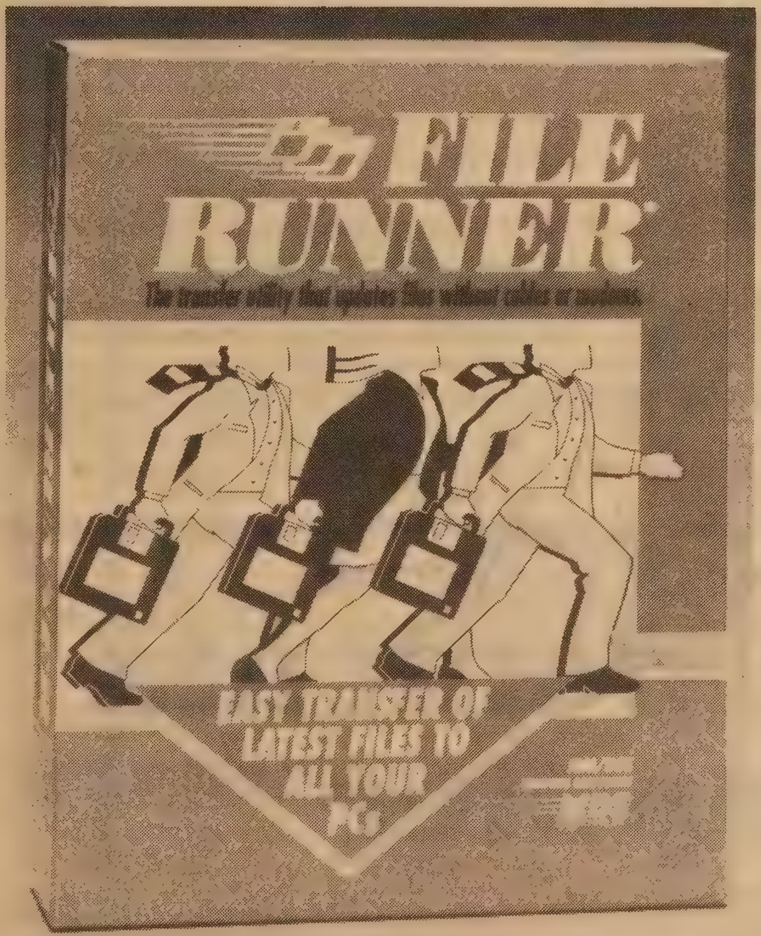
File Transfers Without Cables Or Confusion

FileRunner Solves The Critical Problem Of How To Safely Get The Latest Version Of Your Documents Onto All The PCs You Use

BY ED KAHN

While some use laptops and notebooks for the bulk of their computing, many are still using these convenient portables in conjunction with desktop units. As more people use multiple computers in their daily work, a problem developed—what is the best way to move the most current versions of files between computers? Over the years, various file transfer utilities have become available to help solve this difficulty.


FILE RUNNER
The transfer utility that updates files without cables or modems.
EASY TRANSFER OF LATEST FILES TO ALL YOUR PCs

> **As more people use multiple computers in their daily work, a problem developed—what is the best way to move the most current versions of files between computers?**

The one common element among the various transfer utilities has been the cable that physically connects the computers. Traveling Software's LapLink Professional has been my favorite transfer utility. It is fast, easy to operate, and offers many options when transferring files. But in the end, no matter which utility you choose to use, this could mean a lot of work to move a few files. It also requires that you have both computers in the same location. Although notebooks are getting smaller and lighter, even with these machines it is rarely safe to assume that you will always have your second computer with you when you return from working with your other computer. Sometimes, as a partial solution and to save time, I copy and transfer the files I need via floppies. I have longed for a program that would easily copy files that are in multiple directories onto a diskette and then back onto the second computer, keeping track of when and where the different versions were created.

Now there is an innovative product that does just what I dreamed about, and more: MBS Technologies' FileRunner. You install the program on all of the computers that you use. So, for instance, if you like to work on computers both at your office and at home, you would install FileRunner on both ma-

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chines.

At the end of the day, before leaving the office, FileRunner transfers the designated new and revised files onto a floppy diskette, moving back and forth with you between the two computers.

The program is not designed for people who are trying to copy an entire hard disk between computers. Rather, it is for those who only want to carry around the files they are working on. The first time you use the FileRunner, you tell it which subdirectories you want to regularly move back and forth. In my case, the bulk of the files that I use routinely fall within a few subdirectories; I always need my correspondence files, my current writing projects, my phone lists, and my checkbook files. FileRunner compresses and loads the changed and new files onto a floppy diskette.

As the program examines the files for transfer onto the floppy diskette, it gives you the options of copying, deleting, or omitting each file. This allows you to just move the data files you need for your work. The capacity of the diskette is the only limitation in the number of files you can copy. I found it advisable to limit the number of files transferred, leaving room for new files.

At the second machine, you insert the diskette and FileRunner compares the relevant directories, telling you how many files are new for this machine and how many are later versions of the existing files. It will then allow you to move all of the files onto the second machine, keeping both of your computers in sync.

When you are ready to return to the first machine, FileRunner modifies the files on the runner diskette that have been changed and lets you carry them back to the original machine. If you have erased files from the second machine, the program will ask if you also want to delete them from the diskette. If you have created new files in the selected subdirectories, it will copy them as well.

FileRunner is extremely well designed. There are many safeguards and frills. It asks for the time and time zone of each computer so it can really determine if a file is newer or not. And because the program keeps such good track of versions for each file and logs when you transfer files, it protects against overwriting files that have been changed on both computers. For instance, after moving files back from your portable to your desktop machine, you then change a file on the portable, the next time you transfer files back from the desktop, the program will catch that the file you are now moving from the desktop is not overwriting the same file it previously saw on the portable. You will be warned that the file on the portable has been changed and allow you to give different names to these two versions of the file and examine them both later to determine which one is the right one to keep or how to incorporate both sets of changes.

All in all, a very handy program. I highly recommend FileRunner to anyone who routinely moves between computers at several locations and is tired of *always* carrying one of the machines and the required connecting cables. FileRunner does not completely replace a cabled transfer utility, but it is a wonderful and often crucial supplement. ■

I have longed for a program that would easily copy files that are in multiple directories onto a diskette and then back onto the second computer, keeping track of when and where the different versions were created.

RESOURCES:

FileRunner, $99.95
MBS Technologies, Inc.
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1-800-860-8700

LapLink Pro, $169.95
Traveling Software, Inc.
18702 N. Creek Pkwy.
Bothell, WA 98011
1-800-343-8080

Computer Of The Month

The Momenta Computer

Laptops and portables are pretty generic items these days. Although innovation continues and technological advances are always being made, the basic features seem to be uniform from model to model. Just about any notebook or laptop you choose can do the same job despite the attempt by manufacturers to claim that their computer is fundamentally standard, yet distinctive. From time to time, however, a radically new computer and revolutionary concept appear.

The Momenta is just such a machine. For years now, we have been reading about pen-based computing. Although several of these machines are available, they do not compete head on with standard MS-DOS computers. Rather, pen-based computers are targeted toward niche markets such as meter readers and UPS delivery personnel. The Momenta, however, has struck out in a bold new direction—targeting the standard notebook user and offering a better way to get the job done.

Whether the Momenta really offers a better way is still in question, but there can be no doubt that it has opened the door to new capabilities and potentials.

At first glance, the Momenta appears both similar and distinctive. Rather than having a screen hidden by a clamshell cover, when you remove this computer from its case, its display panel is revealed. Furthermore, it does not have a built in keyboard. Instead, the separate keyboard is easily connected by cable to the computer/display module of the Momenta.

When you turn on the computer, the screen displays a Windows for Pen logo and then takes you into a graphical interface that looks similar to Windows on your desktop or notebook computer. But in fact, you have entered into a new realm of computing. Mo-

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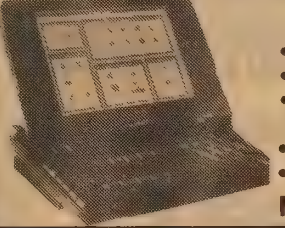

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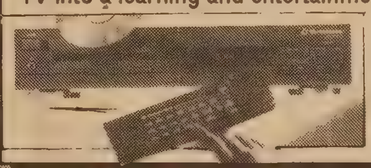

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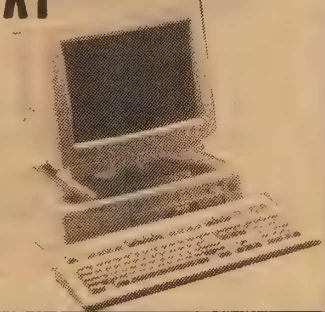

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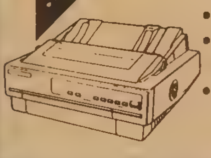

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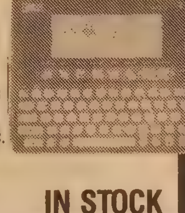

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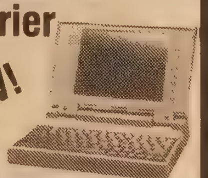

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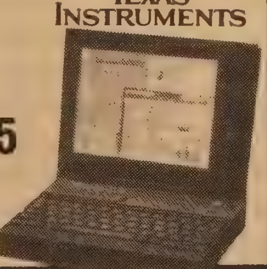

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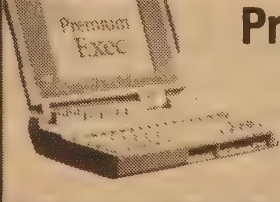

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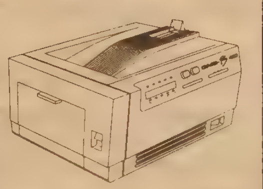

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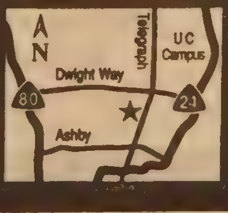

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Whether the Momenta really offers a better way is still in question, but there can be no doubt that it has opened the door to new capabilities and potentials.

menta works with a pen, or stylus, rather than a mouse or a keyboard; although both input devices are still available to the user.

The stylus is used to enter commands by tapping the appropriate place on the screen. But the concept of using a stylus goes far beyond just using this pointing device instead of a mouse. In addition to entering simple Windows commands, you can enter text as well. This can be done in either of two modes.

In the simpler mode, the memo you write is saved as a graphical file and can be recalled. What you are doing is little more than using a computer to store a written memo. This is not really that useful for me because you cannot manipulate text, print it, or do any of the other things that have made word processing so widespread.

In its second mode, however, the power of the computer comes to life. Written text can be deciphered by the computer and translated into standard ASCII characters. Thus, you can enter text and have it converted into the same kind of input that previously only the keyboard could offer.

While this sounds fantastic, in practice it is not quite so simple. The Momenta does recognize a number of letters, and has the ability to learn to recognize the way you make your letters, but it cannot decipher letters that run together as in cursive writing. You are limited to either printing or at least separating each letter so the computer can distinguish separate symbols. And in fact, the computer is not as smart as I would have liked. In my test drive, I found that I had a hard time printing in a way that the computer could understand.

From time to time a radically new computer and revolutionary concept appear. The Momenta is just such a machine.

Fortunately, there are other ways of entering information into the machine. One way is to use a conventional keyboard and run programs directly from DOS. Another way is to call up a small keyboard on screen and touch the letters with the tip of the stylus.

While the Momenta does not yet offer a complete solution, it is clear that this unit points the way to the future. The basic machine is so filled with features that it is impossible in this review to do more than hint at its capabilities. It is set up to handle fax capabilities, even through a cellular connection. It can copy files through the included serial cable to other MS-DOS computers. It can run standard software as well as Windows for Pen, and comes with a package of pen-based applications.

While the documentation with the Momenta computer is only adequate, the company invites you to call their 800 technical support line and spend a half hour with them while they walk you through the basic features of this machine.

Despite its limitations, this is certainly a machine to examine. It is a different species of computer and does tricks the competition can't even imagine. ■

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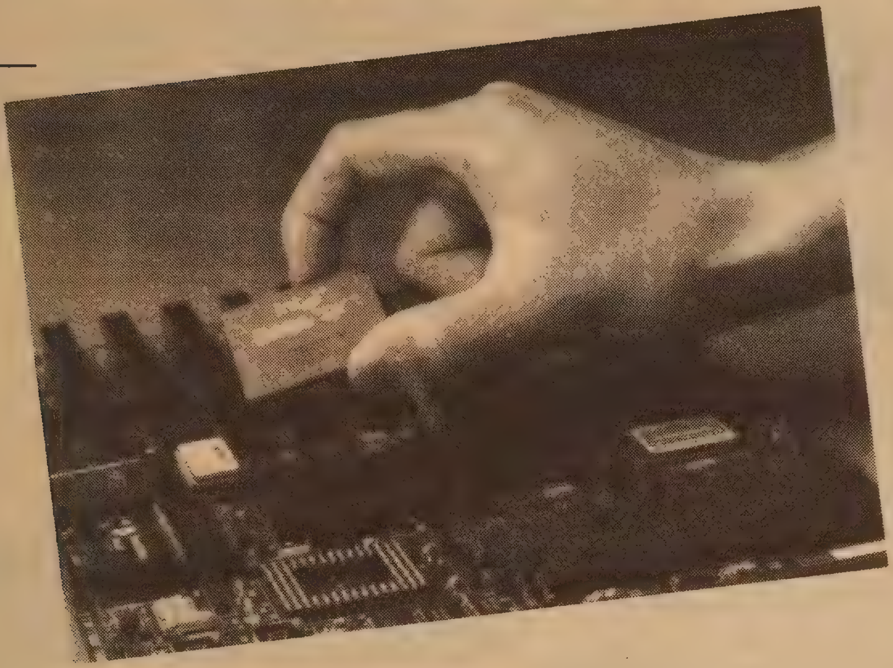

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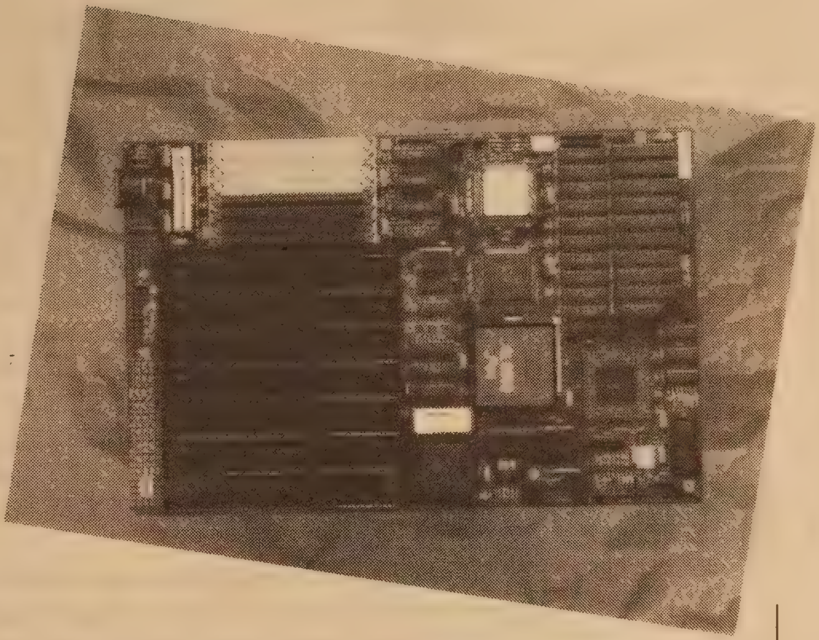

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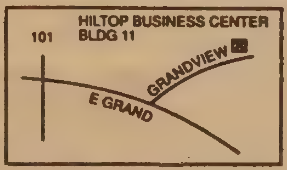

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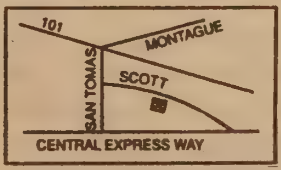

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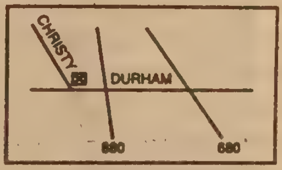

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Batch Processing In UNIX

Write Now, Run Later

BY BENNETT FALK

UNIX

The modern office, computerized or not, is a scary thing. It is a workplace driven by interruptions and emergencies, a workplace in which there is no clear notion of how much work a person can be reasonably expected to do.

Every day, through all the levels of the managerial structure in any business, new and ever-more-urgent tasks are delegated to people whose workdays are apparently already full.

If the office happens to use computers to get things done, the stress level of the office will almost certainly be mirrored by degraded performance of the computer resources shared by the people in the office. And of course, degraded computer performance only feeds back additional stress into the interactions of the computer users.

So when a new set of reports was needed a few weeks ago, I grumbled, put aside what I was working on, and started to run them. Within half an hour a system administrator and a subcommittee of my coworkers appeared to voice some irritation over the unhealthy volume of network traffic and disk space this job required.

I was about to respond with commensurate irritation when I remembered "Weird Mode" Dvorak (no relation).

THE LEGACY OF WEIRD MODE DVORAK

It was Weird Mode Dvorak who introduced me to the "at" command when we both rented computer access from the same timesharing service. The timesharing service charged independently for connect time and CPU time, and there were reduced rates for work done outside of business hours.

Weird Mode Dvorak used the "at" command to defer to some more congenial time the running of computer jobs that weren't interactive and did not need to be monitored. When Weird Mode discovered that he could schedule these "batch" jobs for the hours when CPU time was cheap, he blissfully dispatched his most CPU intensive work to be done at three in the morning.

An additional bonus that particularly appealed to Weird Mode's secretive nature was that the timesharing service's accounting program did not attach connect time charges to these sessions. He had found a way to cheat the system.

The modern office is a far cry from Weird Mode's furtive attempts to economize, but using "at" to defer work to odd hours suddenly became appealing. Scheduling reports to run overnight when the computer resources were only lightly used, would ease tensions in the office and give me a little more control over the daily flow of work.

Copyright © 1992 by Bennett Falk. All rights reserved. Bennett Falk lives in the Bay Area, writes when he can, and hopes for the best. He works for Sybase, but the opinions and attitudes expressed are his own.

THE "AT" COMMAND

The "at" command is a UNIX utility for scheduling something to be run at a specific time. It is deceptively simple to invoke. The command line to run a shell script named "newt" at 11 pm tonight looks like this:

```
at 2300 newt
```

There is a companion command, "batch," that executes the equivalent of "at now."

If the office uses computers to get things done, the stress level of the office will almost certainly be mirrored by degraded performance of the computer resources shared by the people in the office. And of course, degraded computer performance only feeds back additional stress into the interactions of the computer users.

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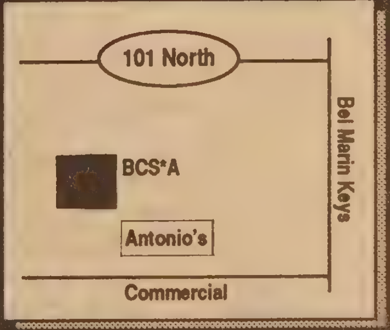

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Strictly speaking, there is no need to include the name of a shell script on the command line. If the script name is omitted, "at" simply reads standard input for the sequence of commands to be executed. (The UNIX convention for signaling the end of this sort of input is control-D on a line by itself.)

By default, "at" will use the Bourne shell to execute the commands it is given, though there is a flag to direct the use of the C-shell on some systems.

"at" has a moderately robust syntax for specifying when the job is to be executed. Any hour, day of the week, date, or year can be specified, and there are operators to specify relative dates as well. To request something be executed in three days use the command:

```
at now + 3 days
```

"at" reports a job number and the time at which the job will be executed. A user can list any jobs pending with the command "at -l."

When a job is scheduled with "at," the commands to be run are copied to a file in the directory /usr/spool/cron/atjobs. The amount of free space in the filesystem that contains this directory is the outer limit on the size of a job that can be scheduled with "at." Once the commands are executed, this file is removed.

What makes the use of "at" nontrivial is that it requires a little skill in writing shell scripts that can be run without human intervention. This takes some attention, but it is not a difficult skill to acquire. Building shell scripts suitable for scheduling with "at" is chiefly a matter of managing the input and output of the commands to be executed, and expecting the unexpected.

Input and output certainly don't manage themselves, but the consequences of not handling them properly tend to appear immediately, and are relatively easy to address. Failure to provide some necessary input may cause the program being executed to fail outright, or simply to hang. The default output handling of the "at" scheduler is to send mail containing both the standard output and any error messages to the user who invoked "at." In many cases, this is a reasonable thing to do; for commands with lots of output, it may be less than optimal.

As anyone could learn from watching Weird Mode Dvorak, it is easier for people to react to the unexpected than to anticipate it. The failure rate of his batch jobs was not good (and, indeed, it is doubtful that he saved any money at all when these failures are taken into account). Weird Mode took programming against any contingency as an opportunity to exercise his almost boundless paranoia. He would probably have been better served by testing his scripts interactively before submitting them.

The business of scheduling batch jobs under UNIX requires something like super-user privileges, and indeed, the mail that notifies a user of the completion of a batch job comes from "root," the super-user login on UNIX systems. Any UNIX command that triggers super-user activity is a potential security hazard, and "at" is no exception.

The system administrator can manage permission to use the "at" command by maintaining a pair of files (/usr/spool/cron/at.allow and /usr/spool/at.deny) listing users who are either allowed or denied access to batch job scheduling.

THE "CRON" COMMAND

The "at" command is the most readily accessible interface to the UNIX clock daemon, "cron." "at" works perfectly well for ad hoc scheduling. For jobs that must be run repeatedly at regular intervals, triggering "cron" directly is probably a better mechanism. Much of the tedium of administering a UNIX system is relieved by scheduling through "cron" tasks that do not need to be attended. Permission to set up "cron" jobs and to construct a "crontab" file (telling "cron" what to do and when) should be managed carefully by the system administrator.

A separate "crontab" file exists in /usr/spool/cron/crontabs for each user who wishes to trigger "cron" activity. Each entry of a "crontab" file contains a time specification (in minutes, hours, days of the month, months, and days of the week) and a command to be executed. Unlike "at," the command specified need not be a shell script, although jobs run by "cron" are executed in a default environment, and it is often useful to use scripts that can set up any special environment variables needed for command execution. Output handling is similar to that of the "at" command.

The concept of batch processing and the tools to do it ("at" and "cron") are "old" technology, something likely to be overlooked in an era preoccupied with user interfaces and style of presentation. However, the problem this old technology addresses, the need to do some kind of load balancing in both the human and machine environments, is more pressing than ever. Regrettably there is no technology to even out the load in human societies. The best we can do is trust the continuum between ourselves and our machines, balance the load on the machines, treat the people kindly, and think fondly of Weird Mode Dvorak. ■

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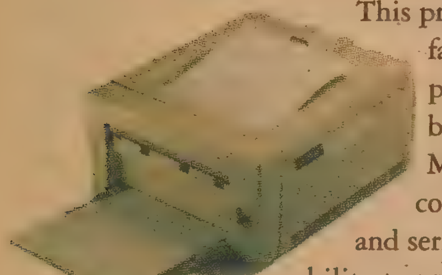

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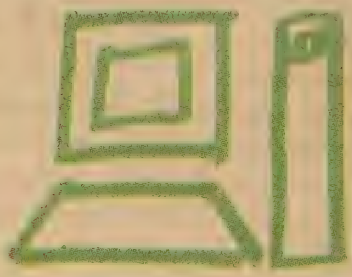

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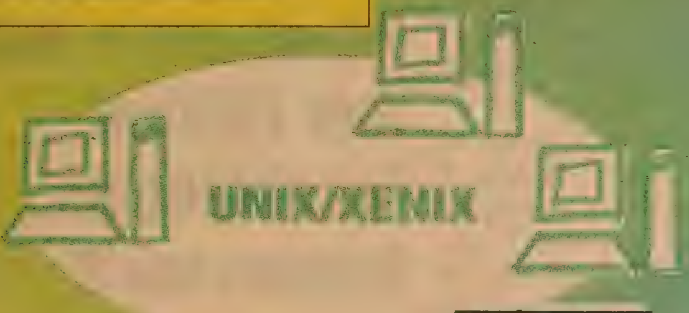

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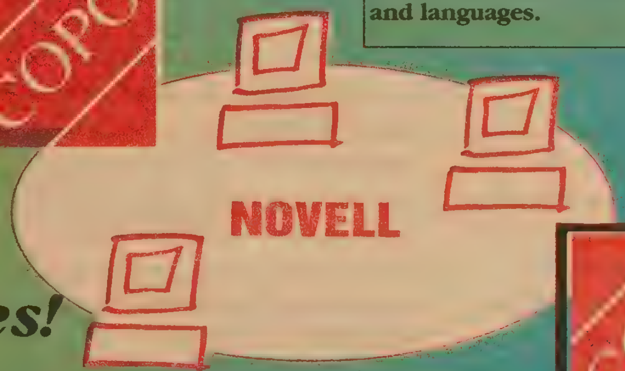

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Voice mail seems to bring out the best and the worst in people. Ask someone what they think of voice mail, and you'll probably get one of two responses: "I love it" or "I hate it."

For better or worse, voice mail is here to stay. The list of government agencies, corporations, even entrepreneurs developing and using voice mail systems as a centerpiece in their enterprise grows almost daily. With robust and inexpensive hardware and software products available for PC-based systems, more companies will be giving you options to "leave a message at the beep" and "press 1 for more options."

Most corporate voice mail systems are expensive affairs, costing tens of thousands of dollars to install and maintain. The introduction of PC-based voice mail hardware has brought the ante down to the point where some friends of mine have installed systems at home.

Brian Berman, president of DemoSource, a company that develops and markets PC-based voice mail systems, explains that they are "ideal for home-based and small businesses that want to put forth the image of a large, established company" without spending the tens of thousands many larger companies put out for their voice mail systems.

Zoetrope Studios, of Director Francis Ford Coppola, *Apocalypse Now*, and *The Godfather* film series fame, uses a PC-based voice mail system in their San Francisco headquarters. "We needed the auto-attendant feature to route calls to individuals after hours, after our receptionist has gone home," says Charlie Lamm, a technician at Zoetrope. The auto-attendant feature is one of the more popular options available to voice mail system users. With an auto-attendant, inbound callers have the option to "enter the extension of the person you are calling, or hold for an operator" (assuming one is available). As long as the caller knows the extension of the person he or she is trying to reach, the auto-attendant can transfer the call directly to that extension.

"I'd say, for the most part, our users like [the system], but they'd wish for more features, like a user directory," says Lamm. User directories are another useful voice mail option. Voice mail systems with user directories prompt inbound callers to enter the first few characters of a person's name if they don't know the extension they're trying to reach. If you were trying to reach me using a system with an auto attendant you would press the buttons 4-2-7 for "HARrison." Once those first few characters have been entered, the user directory matches the pattern of possible letters against the names of people on the system, and lets you select the correct name for the person you're trying to reach.

Aside from needing a tool to route calls after hours, Zoetrope needs voice mail boxes to take messages for people who are away from their desks, and "messages for our independent artists…who may be on-site, working from home, or be on the road somewhere." Voice mail lets Zoetrope employees and consultants dial in and get their messages, whether they're somewhere in the office or somewhere in Morocco.

To support its phone mail system, Zoetrope uses a 286-based PC-AT clone with four Talking Technologies PowerLine 2 boards, an 80MB hard drive, and DemoSource software to support its eight-line, forty-box voice mail system. The system hooks into Zoetrope's in-house PBX, and passes tone dial and hook switch commands back to it to route calls to their destination. Installing the system was easy; Lamm says it "took me and another engineer about a day to install."

To support its phone mail system, Zoetrope uses a 286-based PC-AT clone with four Talking Technologies PowerLine 2 boards, an 80MB hard drive, and DemoSource software to support its eight-line, forty-box voice mail system.

While many companies are using voice mail to help route calls and take messages, others are building their entire business around the many capabilities voice mail has to offer. Phil

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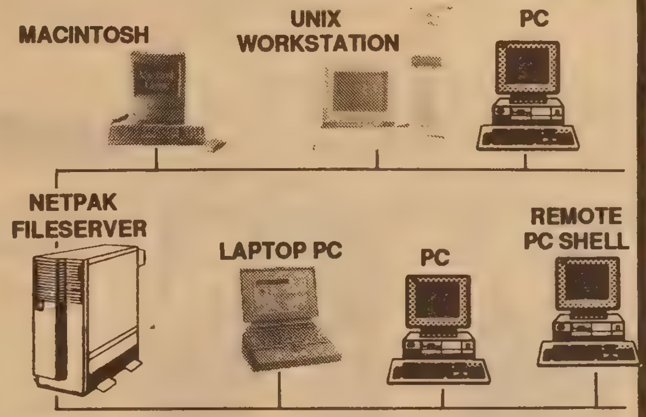

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Granderson has developed a voice mail application called The Real Estate Hotline, which helps potential home buyers find homes that match their general requirements for price and size.

Using a phone with a tone dial keypad, The Real Estate Hotline callers select a San Francisco community they'd like to live in, the number of bedrooms wanted, the type of home (i.e., single-family or condominium), and the price range they are willing to consider. Once this information has been entered, The Real Estate Hotline describes a home meeting the buyer's criteria, and gives the option of going on to another home, or having his or her call forwarded to the realtor presenting the property.

Granderson has had a "good response from buyers, who are very interested in using it to locate the best house for their needs" and agents "who are earning a good living" and recognize the potential lift the Real Estate Hotline can give their business.

Like Zoetrope Studios, Granderson uses a readily available PC-AT compatible, with four Talking Technology PowerLine 2 boards to support his eight-line system, but has opted for a faster 386/25 CPU, and a larger 245MB hard disk. The Real Estate Hotline also uses Pacific Bell's Centrex services to do call routing, which saved Granderson a lot of scarce start-up cash he otherwise would have had to spend on an expensive in-house PBX.

With robust and inexpensive hardware and software products available for PC-based systems, more companies will be giving you options to "leave a message at the beep" and "press 1 for more options."

"It was a tremendous amount of effort scripting and rescripting [the system]," says Granderson, and it took about half a year "to work out all the bugs." The Real Estate Hotline has been a big success for Granderson, successful enough that he has plans to market his system to others interested in setting up The Real Estate Hotline in other areas.

Love it or hate it, voice mail products are providing companies with new tools that help them use their phones more efficiently, and with new approaches to product marketing and support. Voice mail is here to stay; but if you don't like it, I guess you can always "Press the switchhook for more options." ■

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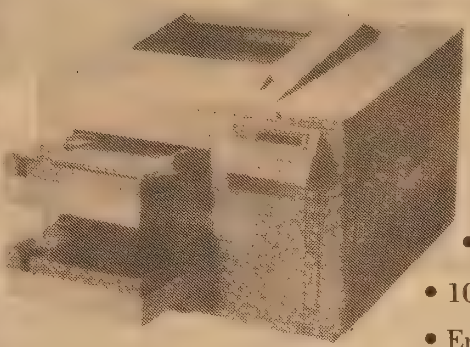

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Connecting Without A Wire

Indoor Wireless Communications Can Be A Direct Replacement For Hard-Wired LAN, Without Changing The Network Operating System, Protocol, Topology, Or Operating Parameters.

BY ROBERT MOSKOWITZ

When personal computers first came in, they revolutionized data processing by making the average end-user completely independent of the MIS department and its massive mainframes. But as more and more information found its way onto personal computers (PCs), hundreds of thousands of business organizations found that networking became a significant concern. Following the same price/performance trendlines as the PCs, today's networks have rapidly evolved into faster, simpler, and less cumbersome systems until, today, it's entirely practical for computers to communicate without any kind of physical connection. It only remains to see to what extent indoor wireless technology replaces twisted pair and other computer network wiring systems.

At the present time, most people see indoor wireless networking mainly as an alternative to stretching wires in difficult or impractical locations. For example, historical buildings usually cannot be wired without destroying irreplaceable internal structures. Many office sites contain asbestos that should not be disturbed for network cable runs. Also, organizations in leased space may not want to invest in network cabling. Technical difficulties may make factories and shop floors very expensive to string with interference-resistant network wires. Quite often, locations such as loading docks or retail stores are impractical for hard-wired networking because the computer operator must move around while working, and simply cannot afford to be rooted to one spot near the network hook-up.

Indoor wireless networking circumvents all these problems because it allows computers to become part of a LAN without requiring any sort of a physical connection, and without having to be fixed to a single spot on the floor. In most cases the wireless link is a direct replacement for a network wire, requiring no change in LAN operating system, protocol, topology, or operating parameters. In fact, many network operating systems are already set up to disconnect and reconnect computers as they physically move in and out of the area served by the wireless links.

If one computer user happens to be on a portable, he or she can thus walk out of the building and leave the LAN without disturbing any of the other network stations. The user can also return a day or a week later and rejoin the LAN almost instantaneously, again without disturbing any communications in progress.

Wireless network products currently on the market use either infrared or radio technology.

NCR's WaveLAN, for example, beams a radio signal as far as 800 feet inside a typical building. The signal has some trouble passing from one floor to the next, but this can be done, too. WaveLAN supports all the popular networking standards, including Ethernet and Token-Ring, Novell, LAN Manager, and UNIX TCP/IP.

Each computer to be networked gets an adapter card connected to a radio antenna that can hang on a wall or rest on a bookshelf. No central transmitter or receiver is required, and each is instantly connected to all other similarly equipped PCs within range. However, at this time no separation of sub-networks is possible, so all the units within range are connected to a single LAN.

Because WaveLAN uses radio, it doesn't require that the computers' antennas have line-of-sight contact with each other. The LAN can cover the exterior "doughnut" of a high-rise office floor, for example, or can blan-

Continued on page 222

The relatively low speed of indoor wireless links is something of a red herring. Few office LANs require anything even close to the maximum transmission capacity of standard hard-wired networks, and most wireless users report little if any performance degradation.

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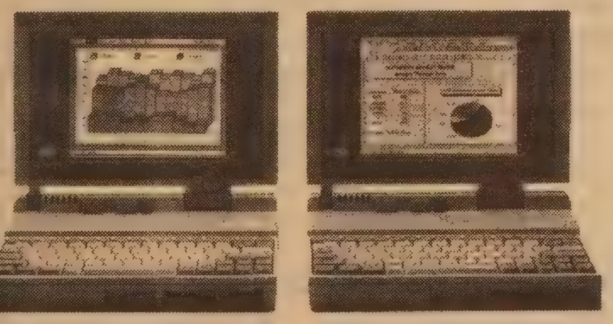

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Electronic Mail On The Go

Solution For A Newly Created Problem

BY KATHLEEN CREIGHTON

Any dyed-in-the-wool telecommer will tell you that one of the big draws of telecommunications technologies is the ability to send and receive electronic mail (email) to others reachable on the same network. It's a way to meet people, communicate with others of a similar interest, locate old friends and lost loves, drum up new business contacts, and conduct that business.

With email's move to corporations through local area networks, people who aren't telecommers are being introduced to the joys of email. Instant communication cuts down on the need for face-to-face meetings and phone messaging, and helps the receiver prioritize tasks by maintaining a running list of unanswered email requests.

The disadvantage to all types of email users, however, is that the receiver has to be physically in front of the email-connected terminal in order to collect a message. Anterior Technology's RadioMail allows you to receive email messages through an alphanumeric pocket pager while you're roaming free of your base network.

RADIOMAIL

The RadioMail user has several options for receipt of one-way email. First, the user is assigned a RadioMail email "address" (the specific group of words and codes that will direct the message to the user's pager). This means that the user does not need a separate email network, though, as a practical matter, most would. The user can either give out the RadioMail address, or receive email forwarded from an existing network. (In theory, any network that can forward email off site can be used to redirect RadioMail.)

Geoff Goodfellow, Anterior Technology's president, says that field trial experience with RadioMail revealed that almost every user would be bombarded with messages; so there are a variety of filters available, either administrative (by having only certain people able to reach the RadioMail user) or through software which allows screening by key words, which eliminates the forwarding of non-urgent messages. One-way RadioMail paging is available now and costs approximately $50 a month.

Two-way email messaging via RadioMail will be available in 1992. The messages will travel over packet radio networks, but require the use of special packet radio modems on both terminals, such as the Poqet palmtop, which will have one built in, or as a laptop peripheral. ■

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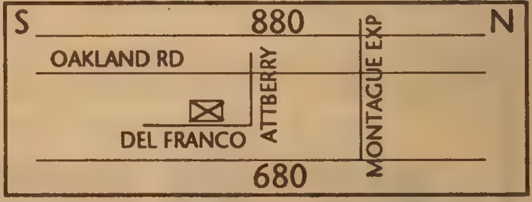

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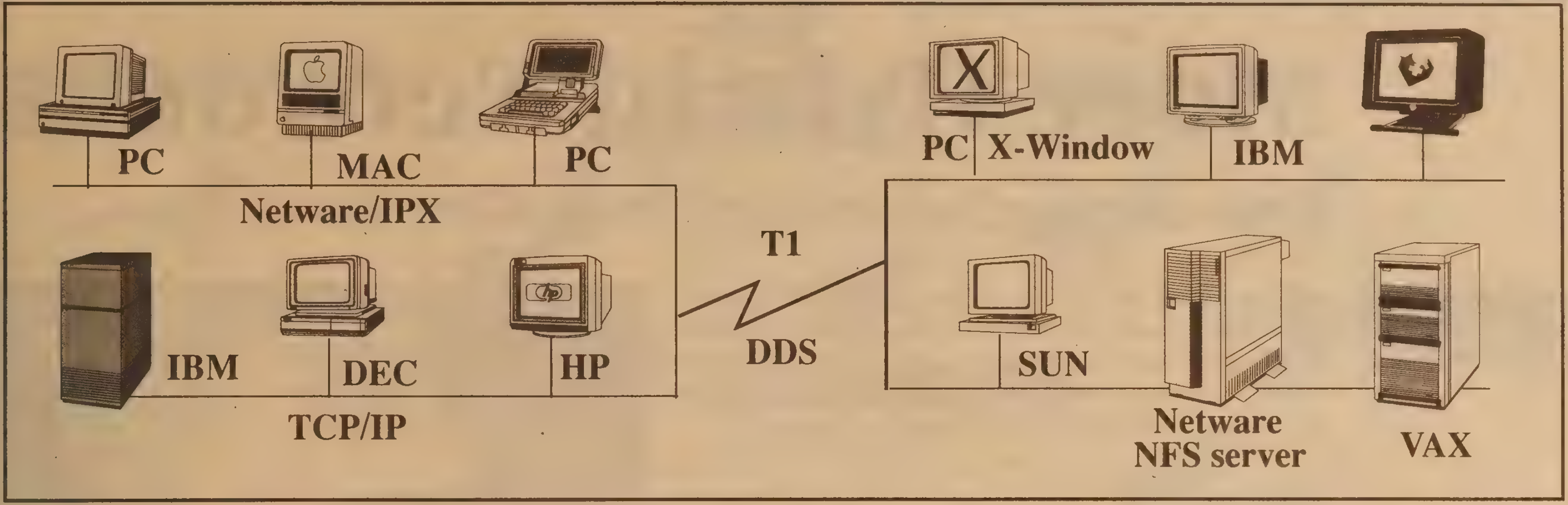

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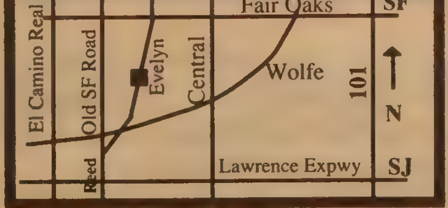

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More Hybrid Networks

Cost-Saving Technology From King Tut

BY YACCO

Copyright © 1992 by Wayne A. Yacco. All rights reserved. An editor, writer, and consultant specializing in microcomputers and their business applications, Wayne Yacco writes articles, columns, and reviews for many trade and business publications. He can be reached at PO Box 269, Burbank, CA 91503.

Last month Milan was in the spotlight here with its Alternet adapter, which converts thin Ethernet to 10BaseT. This month, I've got another device that connects Thinnet to unshielded twisted pair (UTP); but while this product also provides you with the physical layer for Ethernet, it's not 10BaseT.

KING TUT

MagicNet, from Tutankhamon Electronics, delivers on the original promise of 10BaseT. That is, it provides 10-mbps baseband transmission over 100 meters of UTP wire.

Isn't that what 10BaseT *does,* you ask? Not unless you replace your long runs of level-2 direct inside wire (DIW) with the level-4 datagrade stuff. MagicNet actually does 10-mpbs baseband transmission over cheap DIW wire, and it does it over a single pair, not the two pairs requried by 10BaseT. Moreover, it does it for much longer distances. You might even call it "10Base2T." That's a major advancement over 10BaseT, and offers very significant potential cost savings for any application where ordinary DIW is already in the walls.

LOCAL AREA NETWORKS

Interested? You are if you want to build bigger networks and save money.

MagicNet's obvious application is in office buildings with existing communication systems. These typically already have wiring running throughout. However, the wiring is usually limited to just three pairs per drop, and most telephone systems require two of those pairs. That leaves a 10BaseT network one pair short. So, you start wiring all over again. Not so with MagicNet. It works with that remaining pair.

Installing MagicNet in this situation is perfectly simple. Put a MagicNet hub in the wiring closet, connect it to spare wires leading out to the drops, turn on power to the hub, and start installing the local drops. Each local drop can connect to as many as thirty workstations, via Thinnet, through one of Tutankhamon's Assistant Network Managers (NM100).

You begin your local installation by plugging an NM100 into the UTP drop. (Note: King Tut's net uses RJ-11 connectors, not RJ-45s.) The NM100 features an analog meter that takes you through every step of the installation. If the drop is properly wired, the needle on the NM100's analog meter will bounce back and forth between a pair of parallel-wire icons as soon as it's connected. Reversed polarity causes the needle to bounce between a pair of crossed-wire icons. If you hook up to the wrong wire pair altogether, or if the pair is defective, the needle sits on a question mark.

The NM100 Assistant Network Manager is a valuable troubleshooting tool for both setup and maintenance.

When the drop is properly connected to it, you connect the NM100 to one end of a Thinnet backbone. (It must be at one end of the bus, not daisy chained on a T-connector, because it has built-in termination.) Its needle will continue to bounce until a terminator is connected to the other end of the Thinnet segment. If anything is wrong—or ever goes wrong—with the local cable, the NM100 locks the segment out, and the rest of the network is unaffected. (The meter tells you that the segment is down.) If the Thinnet bus is good, the needle sits on zero, and the NM100 connects the segment to the hub.

The NM100's meter will continue to work for you once the network is up, indicating the level of local network traffic. "The relative health of a network," says Tutankhamon president Matthew Taylor, "is indicated by the level of traffic. It's sort of like taking a person's temperature. When your Ethernet is running about 30 to 40%, it's running very well." High traffic levels, on the other hand, are like a fever. They mean the network is inefficient. "If the needle is consistently above 60%, the data throughput decreases," maintains Taylor. He cautions that "Ethernet falls apart at very high levels of traffic."

Fortunately, knowing the traffic level lets you decide when you need to partition your network with a bridge. The NM100 not only provides this information, but its very location tells you where to put the bridge, and allows you to confirm the success of the new architecture.

CASE HISTORY

Corporations clearly have the most to gain from MagicNet—the larger the building, the bigger the bang for your buck—but smaller companies can reap some very special benefits too.

Take for example, the small three-workstation network that an

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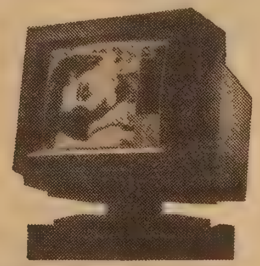

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Fortunately, Anderson had attended a trade show at the Irvine Hyatt the previous year, where he'd discovered Tutankhamon. Anderson reports that Tutankhamon worked with the existing conventional telephone wire: "We connected the workstations with the meter

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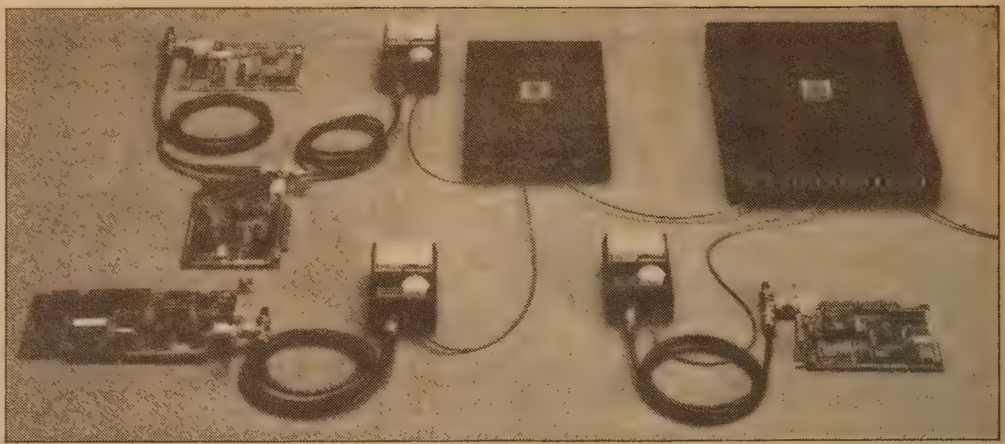

Tutankhamon Electronics offers a full range of products to help you build bigger networks and save money.

[Tutankhamon's Assistant Network Manager], and connected those with the installed telephone wiring to the MagicNet concentrator." Ordinarily, Computer Support's contract cable installers lay datagrade wiring. This time Anderson says, "It was practically nothing to connect the wire."

Anderson also says there were benefits for him. "The first thing I learned about networks was that you never set them up on the customer's premises until you've tested them at your own facility. As we were setting the machines up, the meter made it easy to verify the proper connection. The reason I bought Tutankhamon was to get 10Mbits on a single pair, but this turned out to be a bonus for troubleshooting."

KING TUT'S CURSE (NOT!)

Just about the only drawback to MagicNet is its name. That must change in the near future, because another vendor got to it first. (Some rejected options: DeathMaskNet, SarcophagusNet, GraveRobberNet, DungBeetleNet, and my favorite: TutTutTutNet.)

Other than that, it is true that a MagicNet hub can't connect to a 10BaseT hub with a crossover cable. One type uses one pair, and the other uses two. You can connect a MagicNet hub to a 10BaseT hub, with an NM100 via Thinnet, if the other concentrator has a BNC connector. You can also connect a MagicNet hub with Tutankhamon's Active Balun (AB100). The AB100 is a transceiver, and can connect directly to an attachment unit interface (AUI) port on either a 10BaseT hub or a network interface card (NIC).

The benefits of this medium, on the other hand, aren't limited to old or problem installations. Tutankhamon devices themselves aren't expensive. Yet, two pairs of level-2 wire are much cheaper than four pairs of premium grade, and an NM100 multiplies the number of nodes that can connect to a single UTP drop much like Alternet does. Furthermore, Taylor claims that 75 to 90% of all failures on a network are cable faults. "So," he says, "real network management amounts to monitoring and diagnosing cable problems. The Assistant Network Manager is the only product on the market that diagnoses and monitors cable faults on-line. This is an integral part of your network, and diagnoses better than three-quarters of all your problems." That may sound like commercial hyperbole, and the claimed percentage may be high, but there's a lot of truth in what Taylor says. If you're about to install Ethernet, it could be worth tracing Carter's path into the desert to dig up King Tut. ■

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Part 1: The DESQview Approach

Building Your Own SuperApplication

More Than The Sum Of Its Parts

BY BIRRELL WALSH

If you have applications, why can't you use them together to make "SuperApps"? For instance, why can't you use your communications program to get stock quotes, your spreadsheet to calculate which ones to sell, and your communications program again to send in the actual order? What you have then is a hybrid—either a financially smart telecomm program, or a modem-capable spreadsheet.

These "SuperApps" are possible in the DOS world because of two rival multitasking environments. Multitasking is a trick by which different programs can run at the same time on one computer. The older product is Quarterdeck's DESQview, which has been popular for several years. The newer is Microsoft Windows, which has finally gotten stable enough for a business to trust it.

PLAN VS. REALITY

Perhaps you think that writers sit in a tavern and review topics over a glass of Cynar. Would that it were so. The facts fit more closely with the daily chaos of working life.

I called Microsoft to obtain review copies of Windows 3.1, Excel 4, and Word for Windows. They arrived promptly, but it turned out that to install them would take more disk capacity than I have. Even with Stacker, the disk-compression product of choice, I had run out of room.

So the Windows part of the story went to the back burner, as have many Windows projects, because of the difficulties with hardware and Windows' occasionally cavalier attitude toward compatibility.

DESQview was already installed on my system. It had been stable since about 1986—really!—and takes considerably less room than Windows. It runs DOS applications (graphic or character-based) in happy compatibility. Never mind Windows, I could work with DESQview right now.

Which was fortunate, for in true business fashion my editor asked if I could have the story finished in eight days. I didn't want to publish a review of something I hadn't actually done. Eight days to build a spreadsheet application to evaluate stocks, to develop two communications scripts to get stock quotes and to place orders, to get them to work with each other, and to get them to work with two different online services. This in addition to a normal Fourty-hour work week doing other things. So the development cycle was like most business projects: too little time, and too many specs that have to be met.

I had never built a full-scale macro project in a spreadsheet, and there was no time to deal with finicky products. I chose all my components for reliability:

Online Stock Quotes: CompuServe
Spreadsheet: Quattro Pro 4.0
Telecommunications: LINK
Integrating Environment: DESQview

LINK is one of the DESQview Companions, a package of four small applications that Quarterdeck has sold for some years without a lot of promotion. It is a simple character-based communications program with a strong scripting language.

Quattro Pro 4.0 is a Borland program. I had used an earlier version of Quattro, and also Borland's Paradox for data analysis and graphing, so I trusted the brand name.

CompuServe provides Fifteen-minute-delayed stock quotes (or the latest quote if the market is closed) with a simple request at any command line:

"quote ibm"

gets the response

"IBM 93.500 - 0.375 at 12:03 on 669900 shares"

There is no surcharge for this service. I found I was able to get quotes for the small number of stocks I was following in under a minute from signon to signoff.

DESQview allows several programs to be running at once. With extended memory, it is possible to have several huge programs working at once. Further, the collaboration is true

Because Quarterdeck long ago isolated the co-running applications from each other, I did not have to worry about interactions other than those I had created.

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multitasking. Each program gets a slice of the computer's time before handing off the processor to its playmates. One program can watch for an event while the other is running. A program can also take a larger slice of the processor's time if it has urgent business, like dealing with incoming modem traffic that cannot be deferred. This is preemptive multitasking.

I simulated an online stock service in my directory of The WELL, Sausalito's polymorphic bulletin board.

THE PLAN FOR A SUPERAPP

DESQview has the facilities for "mailboxes." These would function much like Dynamic Data Exchange does for Windows. I say "would," because in fact only specialized developers have used mailboxes under DESQview—people like the US Navy. For most of us, communications between applications has to be with cut-and-paste, or with files.

I chose to use files. Most applications can detect the existence of files, open and read them, and delete them when they have been used. I used files both to start processes and to convey information. I did not want the disk drive to grind incessantly, so I built a small RAM drive in extended memory. Although it used volatile memory, it acted like a disk drive. It made an ideal posting board for messages between the two programs.

My plan was that LINK—the telecommunications program—would call CompuServe and store the quotes in a capture file. LINK would then hang up on CompuServe.

The spreadsheet would already be running, in a loop that it could only exit when it discovered the file with the stock quotes. Then the spreadsheet would come out of its loop and go to work. Quattro would import the quotes, throw away excess or irrelevant lines, and format what it wanted to use. The source file would be erased. The quotes would be copied into a working section of the spreadsheet which would calculate whether to hold the stocks or sell them. Those which were to be sold were copied again, to a "sell-order" section of the spreadsheet. The spreadsheet's last act would be to print the order to an ASCII file on the RAM disk.

The telecommunications program would not be idle all this time. After posting the stock quotes, it would enter a second section of its script which would loop until it found the order file. When it saw the order file it would dial our imitation stock-order service and upload the order. Then it would finish its task by erasing the order file.

Each program would watch the RAM disk for files to appear. Each file would trigger actions by the partner program. Each program would be responsible for erasing the messages that it received.

THE RESULT

To give away the ending: It worked.

DESQview is so stable and compatible that it fades into the background. I had no problem with multitasking the two programs, running them in parallel through hours of development with no crashes or glitches.

DESQview LINK worked like a yeoman. It created and transmitted files with no problems at all.

The development time all went into making a large, hundred-line, two-spreadsheet stock evaluation and order program in

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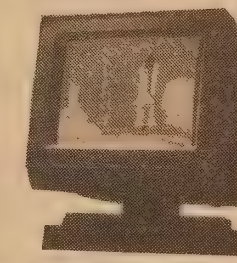

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> **If you plan on integrating two or more programs, count on at least one of them having a venerable and peculiar way of doing its business.**

Quattro. I have no complaints about the program itself, but forgive me a digression about spreadsheet macros.

Macros began as recordings of keystrokes that users wanted to repeat. In Lotus and succeeding spreadsheets, macros also have branching, conditional branching, and looping. What began as an instant replay has evolved into a full-scale programming language. But while most programming languages have grown elegant and easier, spreadsheet macros have just grown complex. Every statement occupies a cell in the spreadsheet itself, as does every variable, so you are constantly jumping around the spreadsheet in search of this cell's address and that macro's block name. Not a process to learn in eight days, I tell you.

Borland has made the medicine as palatable as possible with lots of online help. Press the F1 key from the midst of any tangle, and the help system will make a reasonable guess about your problem and give you advice. The documentation is extensive and helpful. But in the end, there is not much help for it. Someday Borland, Microsoft or Lotus will just chuck the whole tradition of unintelligible macros and install a real programming language in their spreadsheets. My blessing on the one who does it first.

If you plan on integrating two or more programs, count on at least one of them having a venerable and peculiar way of doing its business. Budget time to deal with the idiosyncrasies.

IT ALL WORKS. TOGETHER.

My frustration with learning to use macros was tempered by seeing a real SuperApp emerge. At first clumsily, then with more and more grace, two programs and two online services integrated to become more than the sum of the parts. I wish the word "synergy" had not been overused, because that's what I was seeing.

Quarterdeck is based in Southern California, Borland and The WELL in Northern California, CompuServe in Ohio. Though they had never intended their products to be used together, I had built, in a few evenings of spare time (and admittedly very hard work), an application that integrated the parts they had provided.

At base was the reliability of the multitasking environment. Because Quarterdeck long ago

Continued on page 224

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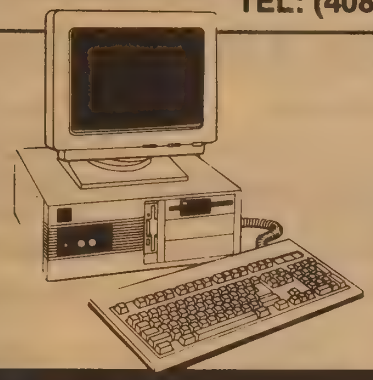

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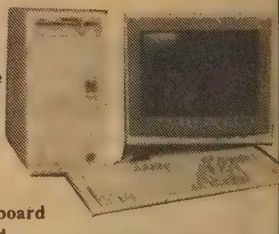

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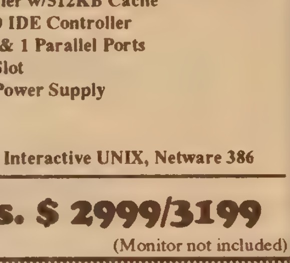

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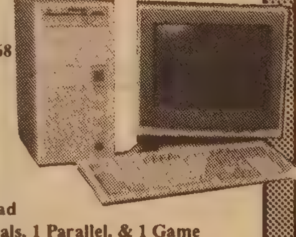
- *Microsoft Compatible Mouse
- *2HD/2FD IDE Controller w/ 2 Serials, 1 Parallel, & 1 Game Ports
- *Mini Tower Case w/ 230 Watts Power Supply

Complete System $ 999

386DX-33/40 MHz ISA 64KB Cache 105MB HD



- *Intel 386DX-33/AMD 386DX-40
- *64KB WriteBack Cache (up to 256KB)
- *4MB DRAM 70ns (up to 32MB)
- *105MB 15ms IDE Hard Drive
- *SAMSUNG SyncMaster 3 1024x768 0.28dp SVGA Monitor
- *Trident 8900C 1024x768 w/1MB SVGA Graphic Card
- *TEAC 1.2MB Floppy Drive
- *SONY 1.44MB Floppy Drive
- *101 Enhanced Keyboard
- *Microsoft Compatible Mouse w/ Pad
- *2HD/2FD IDE Controller w/ 2 Serials, 1 Parallel, & 1 Game
- *Mini Tower Case w/ 230 Watts Power Supply
- *Microsoft DOS 5.0 Package

Complete Sys. $ 1289/1319

386SX-16/25MHz SVGA 40MB HD

- *Intel 386SX-16/AMD 386SX-25MHz
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- *40MB 22ms IDE Hard Drive
- *Super VGA 1024x768 0.28dp Color Monitor
- *Trident 9000 1024x768 SVGA Graphic Card w/512KB
- *1.2MB Floppy Drive or 1.44MB Floppy Drive
- *101 Enhanced Keyboard
- *Microsoft Compatible Mouse
- *2HD/2FD IDE Controller w/ 2 Serials, 1 Parallel, & 1 Game Ports
- *Mini Tower Case w/ 230 Watts Power Supply

Complete System $ 869/889
(32KB Cache Memory add $40)

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Trident 9000 1024x768 w/512KB	$50
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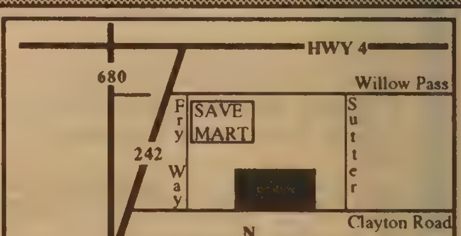

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486/50 ISA DX/DX2 2 Years Parts & Labor	Nice USA	64	1.2/1.44	170MB 15 ms	512K 16 Bit	1024x768 .28 dp	4MB	2S/1P/1G	IDE 2F/2D	Mini or Flat	101	Yes	Yes	$1939/1769
486/33 ISA 2 Years Parts & Labor	Nice USA	64	1.2/1.44	170MB 15 ms	512K 16 Bit	1024x768 .28 dp	4MB	2S/1P/1G	IDE 2F/2D	Mini or Flat	101	Yes	Yes	$1599
486/33 ISA 1Year Parts & Labor	Zetex USA	64	1.2/1.44	105MB	512K 16 Bit	1024x768 .28 dp	1MB	2S/1P/1G	IDE 2F/2D	Mini or Flat	101	Yes	Yes	$1289
486SX-20/25 1 Year Parts & Labor	ICS	64	1.2/1.44	105MB	512K 16 Bit	1024x768 .28 dp	1MB	2S/1P/1G	IDE 2F/2D	Mini or Flat	101	Yes	Yes	$1079/1109
386/40 1 Year Parts & Labor	ICS	64	1.2	105MB	16 Bit	1024x768 .39 dp	1MB	2S/1P/1G	IDE 2F/2D	Mini or Flat	101	Yes	Yes	$955
386/SX-25 1 Year Parts & Labor	ICS		1.2	105MB	16 Bit	1024x768 .39 dp	1MB	2S/1P/1G	IDE 2F/2D	Mini or Flat	101	Yes	Yes	$855

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* Addonics 1024x768 .28 dp 70Hz	375
* NEC 4fg	780
* Mag 14" Sony Tube .25 1280x1024 75Hz	565
* Nanao 1024x768 9070U	875

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* 200 MB	559
* 338 MB	889
* 333 E/C	995
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* 535 MB SCSI	1190

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* Orchid IIs Sierra	169
* Mono	20
* Diamond Stealth	279
* Fahrenheit 1280	269
* Cardinal 765	239

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* Windows & Logitech Mouse	59
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* Tape Back-Up 250 MB	263

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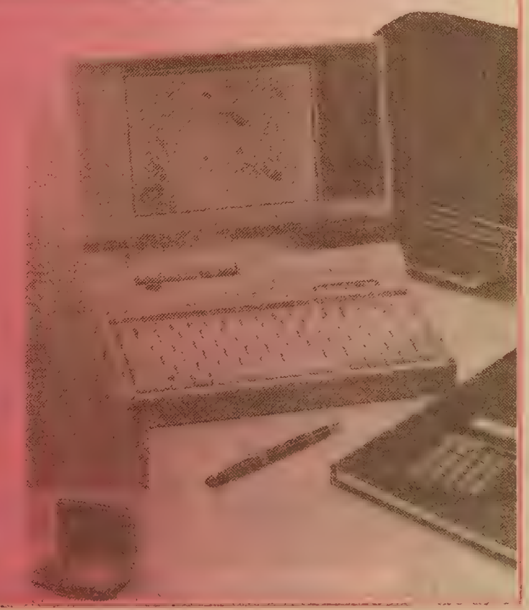

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- Supports MS-DOS, OS/2, Unix, Xenix

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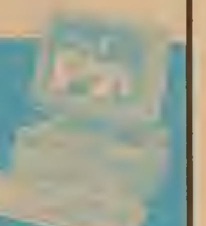

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Maxiswitch 101 Key	45
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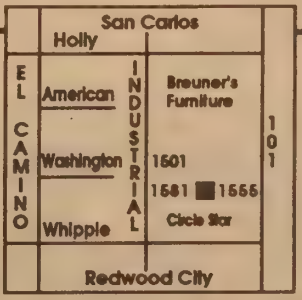

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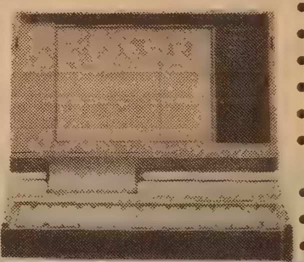

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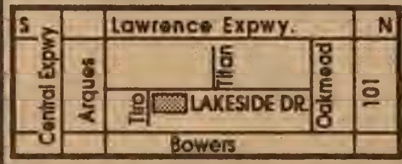

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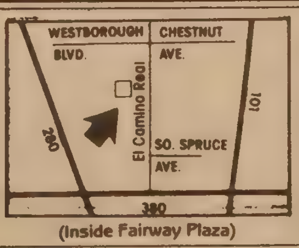

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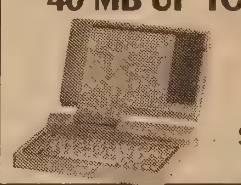

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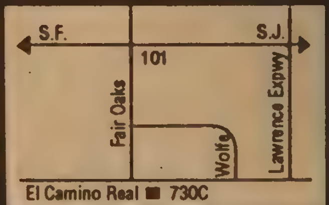

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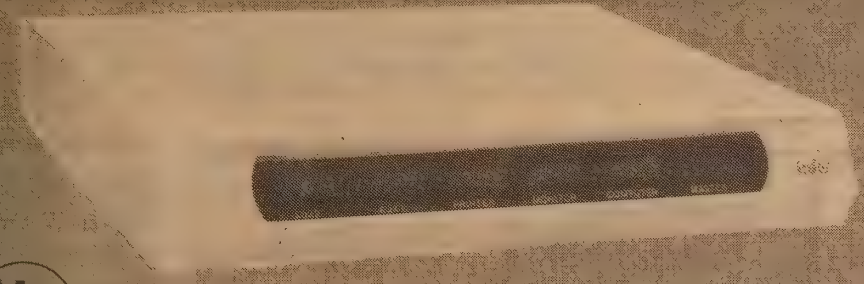

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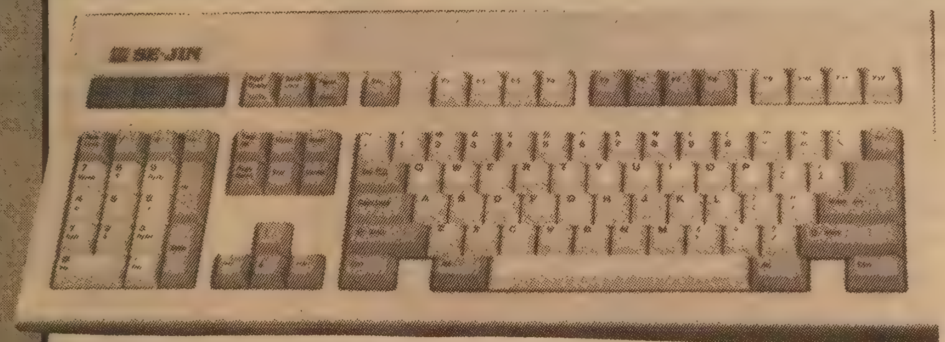

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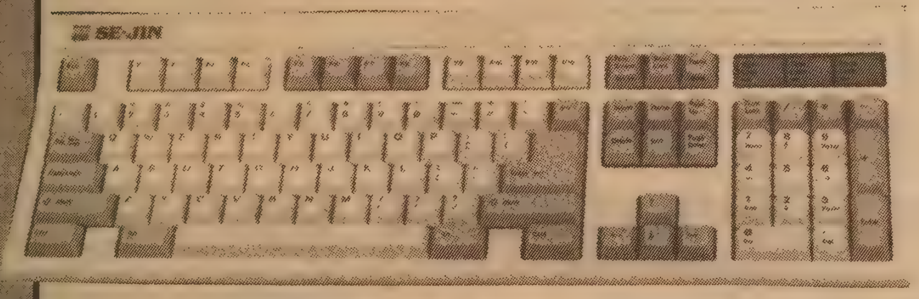

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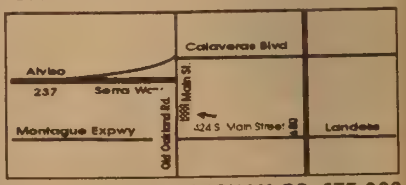

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SACRAMENTO, CA 95827
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SAT.: 11:30 - 4:00

UNIX

FCC class 'B' Approved

BOSS Communications & Systems, Inc.

At *BOSS* we believe in quality and customer's satifaction and we stand behind our products and service. We provide system integration that is AFFORDABLE with MORE POWER and MORE VALUE. We are here to listen to your need. All systems come with 1 year parts and 5 years in-house labor warranty.

NOVELL

Quality & Service

486-50 W/256K Cache

Non-Int. Color SVGA Monitor
340MB Hardisk

BEST

$2650

Intel 80486-50Mhz with 256 KB Cache on motherboard
4MB RAM exp. to 32MB on motherboard
340MB IDE HDD (Maxtor)
Teac 1.2 MB & 1.44 MB FDD
14" SuperVGA Monitor (Resolution:1024x768 @.28dpi)
Tseng ET4000 SVGA display card w/ 1MB (256 colors)
clock / calender build in
IDE controller for 2 Hard / 2 Floppy drives
2 Serial / 1 Parallel / 1 Game I/O ports
101 keys Enhanced Keyboard
Mid-Tower Case with 230 Watts power supply
Microsoft / Mouse System Compatible Mouse (3 button)

486-33 W/64K Cache

Non-Int. Color SVGA Monitor
200MB Hardisk

Power

$1900

Intel 80486-33Mhz with 64 KB Cache on motherboard
4MB RAM exp. to 32MB on motherboard
200MB IDE HDD (Conner \ Maxtor)
Teac 1.2 MB & 1.44 MB FDD
14" SuperVGA Monitor (Resolution:1024x768 @.28dpi)
Tseng ET4000 SVGA display card w/ 1MB (256 colors)
clock / calender build in
IDE controller for 2 Hard / 2 Floppy drives
2 Serial / 1 Parallel / 1 Game I/O ports
101 keys Enhanced Keyboard
Mid-Tower Case with 230 Watts power supply
Microsoft / Mouse System Compatible Mouse (3 button)

386-40 W/64K Cache

Super Color VGA Monitor
120MB Hardisk

Speed

$1300

AMD 80386-40Mhz with 64 KB Cache on motherboard
4MB RAM exp. to 32MB on motherboard
120MB IDE HDD (Conner \ Maxtor \ Quantum)
Teac 1.2 MB & 1.44 MB FDD
14" WEN SVGA Monitor (Resolution:1024x768 @.28dpi)
Trident 8900C SVGA display card w/ 1MB (256 colors)
clock / calender build in
IDE controller for 2 Hard / 2 Floppy drives
2 Serial / 1 Parallel / 1Game I/O ports
101 keys Enhanced Keyboard
Mini - AT Case with 220 Watts power supply
Microsoft / Mouse System Compatible Mouse (3 button)

386-33 W/64K Cache

Super Color VGA Monitor
120MB Hardisk

Standard

$1275

Intel/AMD 80386-33Mhz with 64 KB Cache
4MB RAM exp. to 32MB on motherboard
120MB IDE HDD (Conner \ Maxtor \ Quantum)
Teac 1.2 MB & 1.44 MB FDD
14" WEN SVGA Monitor (Resolution:1024x768 @.28dpi)
Trident 8900C SVGA display card w/ 1MB (256 colors)
clock / calender build in
IDE controller for 2 Hard / 2 Floppy drives
2 Serial / 1 Parallel / 1Game I/O ports
101 keys Enhanced Keyboard
Mini - AT Case with 220 Watts power supply
Microsoft / Mouse System Compatible Mouse (3 button)

80386DX-25Mhz

Super Color VGA Monitor
80MB Hardisk

Value

$1175

Intel/AMD 80386DX-25Mhz
4MB RAM exp. to 8MB on motherboard
80MB IDE HDD (Conner \ Maxtor)
Teac 1.2 MB & 1.44 MB FDD
14" WEN SVGA Monitor (Resolution:1024x768 @.28dpi)
Trident 8900C SVGA display card w/ 1MB (256 colors)
clock / calender build in
IDE controller for 2 Hard / 2 Floppy drives
2 Serial / 1 Parallel / 1Game I/O ports
101 keys Enhanced Keyboard
Mini - AT Case with 220 Watts power supply
Microsoft / Mouse System Compatible Mouse (3 button)

80386sx-25Mhz

Super Color VGA Monitor
80MB Hardisk

Compatibility

$1050

Intel/AMD 80386sx-25Mhz
2MB RAM exp. to 8MB on motherboard
80MB IDE HDD (Conner \ Maxtor)
Teac 1.2 MB & 1.44 MB FDD
14" WEN SVGA Monitor (Resolution:1024x768 @.28dpi)
Trident 8900C SVGA display card w/ 1MB (256 colors)
clock / calender build in
IDE controller for 2 Hard / 2 Floppy drives
2 Serial / 1 Parallel / 1Game I/O ports
101 keys Enhanced Keyboard
Mini - AT Case with 220 Watts power supply
Microsoft / Mouse System Compatible Mouse (3 button)

Optional SCSI Interface Available, Compatible with MS-DOS, UNIX, OS/2, Windows and Novell

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Dealer Pricing Available

We have complete lines of components and hard to find items !!

Now Serve you at 2 locations

Provide All Major Network & Office Automation Products

***BOSS* Communications & Systems, Inc.**
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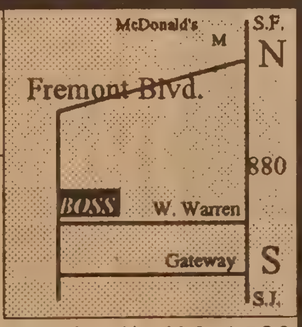

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All prices are subject to change without notice, BOSS communications & Systems, Inc. and Marin computer systems are not responsible for the advertisement that is miss typed or miss-printted. June 1992

ASA COMPUTERS

SYSTEMS

286-12	**$278**
286-20	**$289**
386SX16/25	**$327/349**
386DX25	**$394**
386DX33C64	**$441**
386DX40C64	**$454**
486SX20	**$460**
486DX33C64	**$764**
486DX33C256	**$804**
486DX50C256	**$984**

Including: Case, 1MB, IDE, I/O, 1.2 or 1.44 Teac FDD, 101K KB

ADD --

HDD 40/80/120	**$198/277/349**
Mono Display	**$85**
VGA .39 Std	**$249**
SVGA .28	**$312**

Complete black Systems available

NOTEBOOKS

Bondwell (Made in USA)

SX16, 1MB, 40MB Laptop	$1130
SX16, 2MB, 60MB Laptop	$1355
SX25, 2MB, 60MB NBook	$1845

Top Link (Taiwan)

SX20, 2MB, 60MB NBook	$1585
Clover 386-33,4M,80M NB	$2985

TERMINALS

PC based Terminals --
Network ready, Remote Boot, 1MB, diskless, 12" Mono, KB.

286-12 PC	$410
386SX25 PC	$479
386DX25 PC	$560

WYSE Terminals --

WYSE 30+ w/Keyboard	$305
WYSE 50 w/Keyboard	$409
WYSE 60 w/o Keyboard	$315

Call for other WYSE products.

SERVERS

Ask for free brochure on ASA Thoroughbred family of servers. Novell, UNIX or CAD pre-installed.

ASA Diamond Servers --
486-33 Mylex EISA, 8MB, 213 SCSI CachingDrive and Card, 33MB/sec I/O, 25MB/sec Disk Xfer........$3195

486-33 Cache Comp ISA, 8MB, 213 MB SCSI w/ Adaptec 1542....$2195

UNIX and Novell Engineering support available....

MOTHERBOARDS

Imports --

Conventional Boards

XT-10 w/640K	$66
286-12/20	$62/74
386SX-16 VLSI	$112
386SX-25 VLSI	$134
386DX-25	$179
386DX-33 w/64K Cache	$226
386DX-40 w/64K Cache	$239
486SX-20 Ugrdble to DX	$245
486DX-33 w/64K Cache	$549
486DX-33 w/256K Cache	$589
486DX2-50 w/256K Cache	$769
486DX-33 EISA 64K	$1095

Surface Mount Boards

386DX-33 w/64K Cache	$256
386DX-40 w/64K Cache	$269
486DX-33/2-50 w/64K C	$599/849

US Made --

MYLEX

386SX-16 w/ I/O	$179
386DX-33 w/ I/O, IDE 64K	$508
486DX-33 w/ IDE, I/O 128K	$829
486DX-33 EISA 128K	$1380

Cache Computers (2 yrs)

486DX-33 ISA IDE, IO, 256K	$766
386DX-33 w/64K (upto 8 MB)	$275
TYAN 486 2-50 EISA w/256K ..(upto 256MB RAM, 512K Cache)	$1364
Genoa 386-40 w/64K	$309

CASES/PS

XT Turbo w/ PS	$55
Baby Desk/Tower w/ PS	$63
Medium Tower w/ PS	$89
Full Tower Std/Del w/PS	$109/139
Rack Mount W/PS	$299
File Server w/ 400W PS.3 Fans... 12 F/HDD, black/beige	$549

BLACK

Baby Desk/Tower w/PS	$91
Medium w/PS	$135
Full Tower w/PS	$152

See elsewhere for Black matching Keyboard, Mouse, SVGA Monitor

External HDD Cases

1FH/2HH...65W	$79
2FH/3HH...65W	$139

Power Supplies

XT Power Supply	$38
PC Power XT Turbo Cool 230	$85
220 AT	$48
PS2 200W	$42
PS2 300 W	$99
Full Tower 230W	$61
Full Tower 300/400	$80/154

UPS's see in Networking Products

CONTROLLERS

IDE 2FD/2HD	$13
IDE 4FD/2HD	$33
IDE w/ 2SPG	$19
IDE Caching UltraStor	$235
MFM ST21M	$39
MFM DTC	$59
RLL 4FD/2HD	$69

SCSI

DTC	$109
Future Domain Comp	$54
ADAP 1522B/Kit	$129/157
ADAP 1542B/Kit	$239/269
ADAP 1740 EISA	$469
DTC EISA Caching	$485
MYLEX EISA Caching	$584
DPT Smart Cache+ ISA	$460
DPT Smart Cache+EISA	$540
DPT +Caching Module	$385
DPT 4MB Mem Module	$454

ESDI

DTC	$119
Maple 64K	$107
Ultra 12F 32K	$164
Ultra 22F Caching EISA	$449
XT FDC360/1.2	$13/24
XT HDC	$45

ADAPTERS

MGP	$12
Color Card	$23

VGA/SVGA

VGA 256k/512k	$31/46
Trident 1MB	$69
Tseng 1MB	$99
Orchid II, IIs	$149
Orchid IIs w/ 32K Color	$172
Orchid Fahrenheit	$236
Genoa 1MB 32K Color	$159
V7 VRAM II 1MB	$285
Diamond Stealth	$245
Mylex GLI	$269
ATI Ultra Grpx 1MB	$415

For Accelerator Boards see Engineering section.

Terms

2% off on items that are not in stock & you are willing to wait for them - Main Branch Only COD, FOB Santa Clara.

Besides Purchase Orders, Credit Cards, Cheques, we accept Cash too..

Warranty: Parts -- One year Manufacturers warranty, some parts may have longer term. Labor -- Three years on systems assembly only. Corporate Leasing / Personal Financing available.

DRIVES

Floppy

Teac 1.2/1.44	$58/53

IDE

CON 20	$109
ST351/CON/Q40	$188
CON/Q/WD 60/80	$205/264
ST/CON/Q/105	$299
CON/MXT/ST 120/130	$324
Quan 170	$429
CON 170	$375
CON/MXT 200	$539
ST 240	$589
MXT 340	$834
Fuj/CON 425MB/540MB	$1085/1135

MFM/RLL

ST40	$217
ST80......full h.	$269
ST 32 RLL	$245

ESDI

ST 172/338	$737/1167
MXT203	$757
MXT338/670	$1067/1299

SCSI

CON 40	$209
CON/MXT 105/120	$320/345
CON/MXT 204	$579
CON 540	$1245
ST 89 5.25"	$287
ST 172/338 5.25"	$607/1057
ST 4766N 680	$1299
ST 1.2GB	$1795
MXT 81/157....5.25"	$297/827
MXT 213/340	$587/925
MXT 670	$1322
MXT 1G	$1795
FUJ340/425/540	$995/1145/1185
FUJ 680	$1245
FUJ 1G...........5 yr	$1795
ST/MXT 1.7GB	$2195

REMOVABLE

Syquest 44MB Dr	$318
Syquest 88MB Dr	$415
Bernoulli 44 Insider	$820
Bernoulli 90 Insider	$840
Cartridges see storage media	
IDE: Upto 1GB removable kits	$39

TAPE

Colorado 120MB	$198
Colorado 250MB	$255
Colorado 700MB	$750
Archive 525S	$795
SEI [parallel-port interface] 250MB.. ....ideal for moving from unit to unit... ...5.25" Archive SCSI, full kit	$845

NOTEBOOK DRIVES

40MB 2.5" IDE	$256
60MB 2.5" IDE	$255
80MB 2.5" IDE	$

MONITORS

Mono 12"	$73
Mono 14"	$93
Mono 9" VGA	$108
Mono 14" VGA	$109
Black SVGA 1024,.28	**$309**
VGA 640,.39	$221
VGA 640,.28	$269
SVGA 1024,.28..Hyundai	$279
SVGA CTX Autoswitch	$299
SVGA PB Made in Japan	**$325**
M/Syn V3	$447
Sony 1304S	$569
SVGA NI CTX	$339
Samsung 15"	$499
Samsung 17"	$769
Magnavox 20" 1280 NI	$1357

see our engineering section for a bigger list of monotors.

STORAGE MEDIA

Floppy 1.44 Bulk	$.79
Floppy 1.2 Bulk	$.49
Tape DC2000XL	$18
Tape DC2120 250MB	$19
DAT 4mm 60/90 mtr	$19/29
DAT 8mm 54/112 mtr	$18/24
Syquest 44MB Cart	$73
Syquest 88MB Cart	$119
Bernoulli 44MB 3Pk	$315
Bernoulli 90MN 3Pk	$442

SERVICES

On-Site Repairs: per year.

1-5 PCs/site........per PC	$200
6-10 PCs/site......per PC	$175
10-50 PCs/site....per PC	$150
over 50 PCs/site...per PC	$100

any generic PC.

In-Plant Repairs:
We have 3 years assembly warranty on the systems built by **ASA.**

Parts and modules have their own manufacturers warranty - ask for details

$35 for diagnosis and reassembly on out of warranty **ASA** or non-ASA machines.

Upgrades minimum........................$5

Custom integration for **Industrial PCs**

please inform us of any typos.

"Integration and service with pride"

SOFTWARE

Utilities

Norton Anti Virus/Utilities	$89/114
PC Tools 7.1 w/Antivirus	$99
MS Works	$95
After Dark	$39
Carbon Copy Plus 6.0	$110

Databases/Worksheets

DBASE IV 1.1	$470
FOXPRO 2.0	$490
QuattroPro/Lotus 1-2-3	$310/403
MS Excel for Win	$301

Desktop Publishing/CAD

MS Word 2.0 for windows	$310
Harvard Graphics for Win	$335
PageMaker for Win	$475
Word Perfect 5.1	$256
Corel Draw 2.01	$397
Adobe type manager	$65
Design CAD 3,1 3D	$218

Operating Systems

SCO UNIX DEV sys3.2.2	$
SCO UNIX m user 3.2.2	$
DOS 3/4/5 w/sys	**$36/42/52**
DOS 6..DR	**$69**
Windows 3.0/3.1 upg w/sys	**$49**
Windows 3.0 w/mse w/sys	**$64**

BUSINESS

DacEasy 4.1	$84
ACCPAC BPI	**CALL**
ACCPAC PLUS	**CALL**

CRYSTAL SERVICE - ACCPAC SUPPLIMENTS

Jian BizPlan Builder	$89
Jian Employee Manual Builder	$89
Jian Living Trust Builder	$89

[sales and support on all accpac modules]....

SPECIALS

US Made 486-33,
1MB RAM, 1 Teac Floppy Drive
130MB SGT3144 HDD
Color 14" SVGA .28
Baby Case
"FCC B"................$1569

386-33 64K, 1MB
Mini Tower, 1 Teac Drive
80 MB IDE, Cont.
101 Keyboard
Mono 14" VGA
"FCC B"
...................$999

386SX25, 1MB
Mini Tower, 1 Teac Drive
40 MB IDE, Cont.
101 Keyboard
12" Mono Display
"FCC B"...............$699

MICRO MARKETPLACE

ENGINEERING CAD/CAM

Monitors

Hitachi	
15MVX 15" FST .28, LMF,70Hz	$599
CM2085 20" 1280 Anti Glare	$1425
CM2087 20" 1280 72Hz.Micro	$1840
CM2187 21" FST 1600 Micro	$2390
Toshiba	
P17CU01 17",FST,1024,70Hz	$960
P17CS01 17",FST,1280,.26	$1292
P21CM00 21",FST,1280	$2129
Sony	
CPD1304S 14",*MPRII*,70Hz	$569
CPD1604S 17"	$1039
GDM1936 20" Trinitron	$2489
Idek	
MF5217 17",1024,70Hz	$970
MF5221A 21",LMF,1280,72Hz	$2020
MF5421A 21",LMF,1600,.26	$2445
Taxan	
MV550 15",FST,.28,70Hz	$599
MV850 17",FST,70Hz	$929
Nanao	
9080I 16",1280,.28,*MPRI*	$995
F550I 17",FST,1280,.28,*MPRII*	$1170
T560I 17",Trin,1280,.26,*MPRII*	$1909
T660I 20"Trin,1280,72Hz,*MPRII*	$2549
Magnavox	
20CM64 20",1280NI,.31	$1357
NEC	
3FGX 15",.25	$659
4FG 15",.25,Microp	$769
5FG 17",.26,Microp	$1409
6FG 21",.26,Microp	$2895

GRAPHIC ADAPTERS

NUMBER NINE #9GXi	
L22 Win,T34020,1280,72Hz,16C	$944
L23 ACAD,T34020,1280,16C	$1228
L24 Win,T34020,1280,256C	$1304
L25 ACAD,T34020,1280,256C	$1446
HERCULES	
GOLD 16, Ti34010	$386
GOLD 16+2, Ti34010	$509
GOLD 24, Ti34010, 24 Bit	$456
GOLD 24+2, Ti34010, 24 Bit	$575
VMI	
X/Series 16,1280,72Hz,DPC	$1497
X/Series 256,1280,72Hz,DPC	$1797
Cobra Sp,1024,72Hz,Rend Rdy.	$1077
Design Master, 32k Color	$315
MYLEX	
GXE020B Ti34020	$1045
DIAMOND COMPUTERS	
Speedstar+	$148
Speedstar 24	$169
STEALTH 1MB	$245
GENOA	
7900 16m Color (24 bit)	$182
7860 1MB Hi-Color	$155
8860 S3 Chip Hi-color	$249

Sorry,we don't have the Monitors, Plotters, Digitizers, & Scanners on Display. Please treat these as Catalog orders.

VIDEO BUNDLES

MONITOR, CARD & CABLE	
Hitachi CM2087/X-Series	$3288
Idek MF5217/Speedstar 24	$1032
Toshiba P17CU01/Dia Stealth	$1207
SONY 1304S/Speedstar+	$695
Hitachi CM2085/Dia Stealth	$1653
Hitachi 15MVX/Speedstar+	$739
Nanao T660i/#9GX L22	$3440
Magnavox 20"/Dia Stealth	**$1575**

PLOTTERS DIGITIZERS SCANNERS

PLOTTERS

HOUSTON INSTRUMENTS	
Im Maker 1117,A/B,8 Pen,HPGL	$699
DMP-161 A-D, 8 Pen, HP-GL/2	$2933
DMP-162 A-E, 8 Pen, HP-GL/2	$3827
DMP-162R A-E, 8 Pen, Roll Med.	$5104
ENCAD	
SP600 A/B, 6 Pen Desktop	$585
SP1800 A/D, 8 Pen, Sheetfeed	$2480
SP2800 A/E, 8 Pen, Sheetfeed	$3080
SP4820 A/D, 8 Pen, Roll Feed	$4295
SP4830 A/E, 8 Pen, Roll Feed	$4648

DIGITIZERS

SUMMAGRAPHICS	
II 12x12 w/16btn or 4bt & Pen	$324
II 12x18 w/16btn or 4bt & Pen	$579
KURTA	
XLP 12x12 w/4btn & Pen	$295
XLP 12x18 w/16btn or 4btn,Pen	$529
IS/ONE 12x12 4btn/12btn/Pen	$339
IS/ONE 12x17 4btn/12btn/Pen	$575

(IS/ONE also available w/Cordless.. ...4btn or Pen at same price)

SCANNERS

AERO/ARTEC	
Hand BW 16 Greyscales	$99
Hand 256 Greyscales	$199
MICROTEK	
Edge Feed MS-II Omni, Kit	$729
Flatbed 600G Photostyler, Kit	$1056
Flatbed 600Z Photostyler, Kit	$1344
THE COMPLETE PC	
1/2 Page 400	$196
1/2 Page Greyscale	$256
Page w/Calera WS	$589
Complete Flatbed	$978
ARTISCAN - (Flatbed)	
3000C 300dpi, 24bit color	$1045
6000C 600dpi, 24bit color	$1195
8000C 800dpi, 24bit color	$1455
Slide Scan Kit	$595

ASA COMPUTERS

NETWORKING PRODUCTS

ADAPETRS/KITS

NOVEL ORIGINAL	
NE2000 16bit Thin/Thick	$169
ADVANCED LAN NETWORK	
NE2000 Comp 16bit Thin/Thick	$107
NE1000 Comp 8bit Thin/Thick	$94
Arcnet 8/16 bit	$59/69
WESTERN DIGITAL	
16 bit Ethernet Thin/Thick	$169
8 bit Ethernet Thin/Thick	$149
3COM	
3C503 16 bit Thin/Thick	$177
3C507 16 bit Thin/Thick	$294
D-LINK	
16 bit 10BaseT	$129
MYLEX LNE	$327
ARTISOFT	
AE-2 Lantastic Kit	$459
AE-2 16 bit Adapter	$199
Z-2 Lite Kit 2 Stations	$94

POCKET LAN ADAPTERS

ADVANCED LAN NETWORK	
CN50ET 10BaseT	$199
CN50E Coax 10Base2	$199
CN50A Arcnet	$149

HUBS

D-LINK 12 Port 10BaseT	$585
D-LINK 4 Port 10BaseT Int	$295
D-LINK DE-1500 w/SNMP	$920
Comp 12 Port 10BaseT	$535

INTELLIPORTS

COMPUTONE	
Advantage 8 ATV8-DB25	$515
Intelliport AT8-DB25	$625
Intelliport AT16-DB25	$1088

UPS's

AMERICAN POWER	
APC 200VA, SB, 5 Min	$109
APC 400VA, SB, 15 Min	$166
APC 600VA BK, SB, 10 Min	$269
APC 800VA, SB, 10 Min	$549
APC 1200VA, SB, 10 Min	$779
APC SMART 400	$335
APC	$415

NOVELL NETWARE

Ver 2.2 5/10 User	$501/1117
Ver 2.2 50/100 User	$1957/3077
Ver 3.11 5/10 User	$613/1397
Ver 3.11 20/50 User	$1957/2797
Ver 3.11 100/250 User	$3917/6997
LITE	$69

(NOVELL PREMIUM NETWARE - **FREE NEXT UPGRADE** - Available)

NETWORK CABLES

ETHERNET RG58 CABLES	
Readymade w/Conn 10'/25'/50'	$7/10/16
1000' SPOOL	$99
Terminators/All Conn	$2 ea.

MULTI MEDIA

Sony CD-ROM 535 Int Kit	$345
Sony CD-ROM 541 Int SCSI	$435
NEC Ext Par Port [Speakers, 7 CDs..]	$529
...Ext SCSI (full set as above)	$508
7 Pak.. [Mam,Ill Ency 2.0, World & Us, .Ref Lib,Game II, Nat Geog]	$130

ASA CD Ctlg 150 Titles.Free

SOUND BOARDS/KITS

BROWN-WAGH	
Sound Blaster Pro	$198
MEDIA VISION	
Thunder Board w/Speakers	$109
Pro Audio Spectrum 16	$245
Multi-Media Upgrade Kit Plus Int	$785
....Upgrade Kit Pro16..Int	$983
.....Multi-Media Video Adapter	$834
CREATIVE LABS	
Multi-Media Upgrade Kit Internal	$605
Multi-Media Upgrade Kit External	$675

COMPUTER VIDEO

PROCOLOR	
Mutli-Source Image Capture	$637
..plus 100 Multiple Frames	$785
VGATV VGA to NTSC/S-VHS	$489
LOGITECH	
Fotoman	$529
Scanpad	$15

VIDEO MONITORS

SONY	
PVM-2030 BS21",Color,640x200	$985
PVM-2530 BS27",Color,640x200	$1295

COMMUNICATIONS

MODEMS/FAXES

2400 Modem Int	$40
2400 Modem Ext	$74
2400 Pocket Modem	$84
96/24 Fax/Mod for win	$91
96/24 FAX/Modem	$69
THE COMPLETE PC	
The Complete Communicator	$299
US ROBOTICS	
9600 V.32 V.42bis..Int/Ext	$278/299
14,400 Sportster Int/Ext	$328/362
14,400 CHST/PC-N Int V.42	$553
14,400 HST Courier Dual V.32bis	$790
96/96 Fax/Modem	$339
ZOOM 14,400..Int VPV32..[*]	$279

[* to be released]

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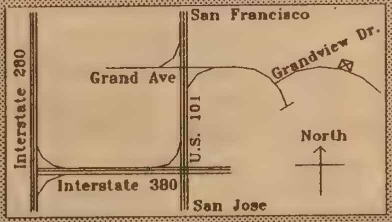

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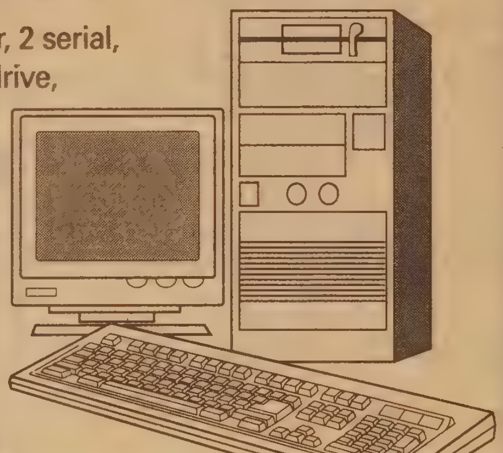

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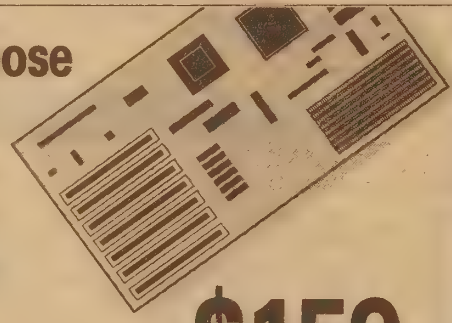

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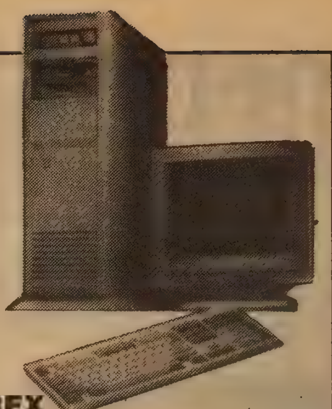

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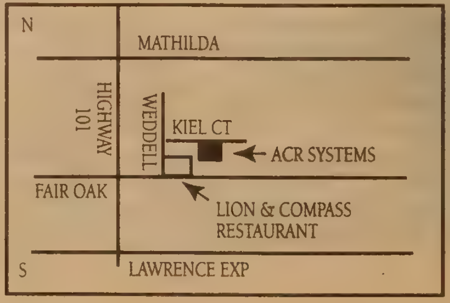

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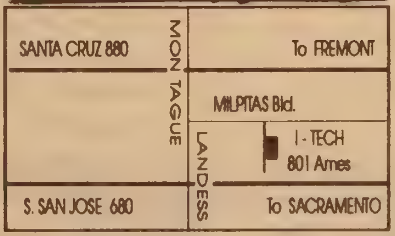

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Quality Is Alive And Well In Milpitas

Baldrige Award Winner Solectron Sets The Standard For Manufacturing

BY MARY EISENHART

"This country has been losing ground in manufacturing in the last twenty years, so we want to revitalize American manufacturing competitiveness."

—Winston Chen

PHOTO: PAUL WINTERNITZ

"Our customers focus on front-end design, product introductions, marketing, finance, and we support them on the manufacturing side."

For the last few decades, US manufacturing has been in decline, and nowhere is this more evident than in the computer industry. For a myriad of reasons, from high costs to quality control to Byzantine tariff restrictions, a large number of vendors have given up their domestic manufacturing operations and moved offshore.

In 1987, as part of an effort to boost US competitiveness in world markets, Congress established the Malcolm Baldrige National Quality Award in three categories: manufacturing, small business, and service. Previous winners have included Motorola, Xerox Business Products, Cadillac, and Federal Express. Last year Solectron Corporation, a fourteen-year-old manufacturing company in Milpitas, became the first Bay Area winner of a Baldrige award.

Solectron got its start in 1977 repairing Atari video game systems and rapidly moved into the board-stuffing business. As the industry evolved, Solectron prospered; as pricing became competitive and product life-cycles shorter, an ever-growing number of vendors found it more cost-effective to focus on their strengths in innovation and marketing and contract the actual product assembly to specialists like Solectron. Today Solectron's customers include such industry leaders as IBM, Apple Computer, Hewlett-Packard, Sun Microsystems, and Silicon Graphics, as well as companies involved in such fields as avionics and medical imaging.

Currently chairman and co-CEO, Winston Chen served as president of Solectron from 1978 to 1990. A native of Taiwan and first in his class in the civil engineering department at National Cheng Kung University in that country, Chen received a Ph.D. in applied mechanics and mathematics from Harvard University. From Harvard he went on to work for IBM in San Jose, as manager of printed component integration and manager of tape head technology, before moving to the startup Solectron. In 1989, Chen's former boss at IBM, Koichi "Ko" Nishimura, joined Solectron as COO. He now serves a president, and the two men share the CEO responsibilities.

Chen sees company-wide obsession with quality as the key element in Solectron's success. Manufacturing processes incorporate the best qualities of Japanese and American techniques, from just-in-time manufacturing to a strong sense of individual responsibility for the product—e.g., if something's not right, any employee can stop the production line and fix the problem. Solectron surveys its customers weekly in order to monitor their satisfaction level, which appears to be pretty high—their on-time delivery rate is 97.7%, and defect rates have fallen to 233 parts per million. That's not good enough, though—they're aiming at 3.4 ppm by 1994.

None of this could have been achieved without a dedicated work force, and Solectron invests heavily in its employees, many of whom are recent immigrants who speak over twenty different languages. The company sponsors a program called Solectron University, which includes classes in management training, electronics, and English as a second language; there's a strong commitment to helping employees advance within the company.

Solectron's even exporting its unique manufacturing culture—last year it opened a facility in Penang, Malaysia, which runs according to the same principles as the Milpitas plant.

In March, Chen addressed a meeting of the World Forum, describing his experiences when he accompanied President Bush and various US executives to Japan and other Pacific Rim countries. We were intrigued not only by Solectron's success but by Chen's views on US competitiveness in increasingly global markets, so we visited Solectron and asked some questions.

What do you see as Solectron's mission?

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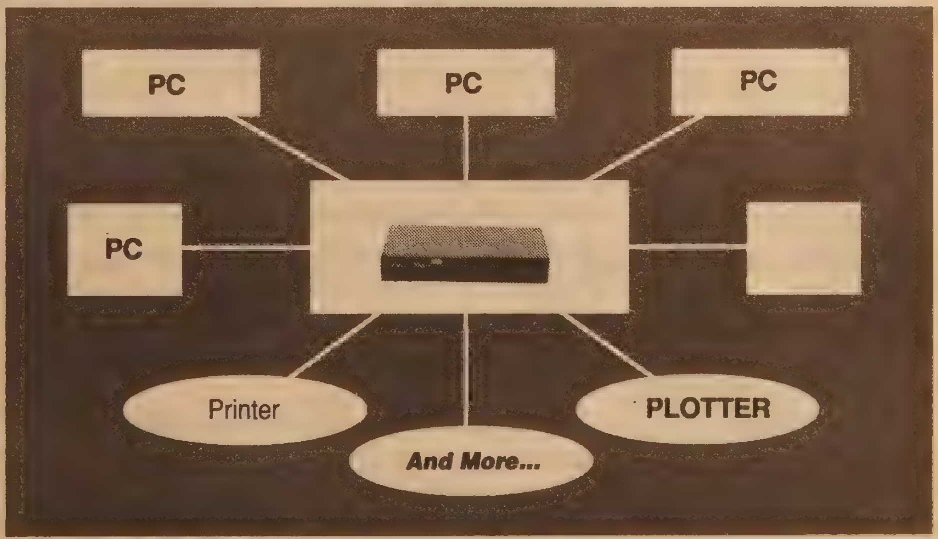

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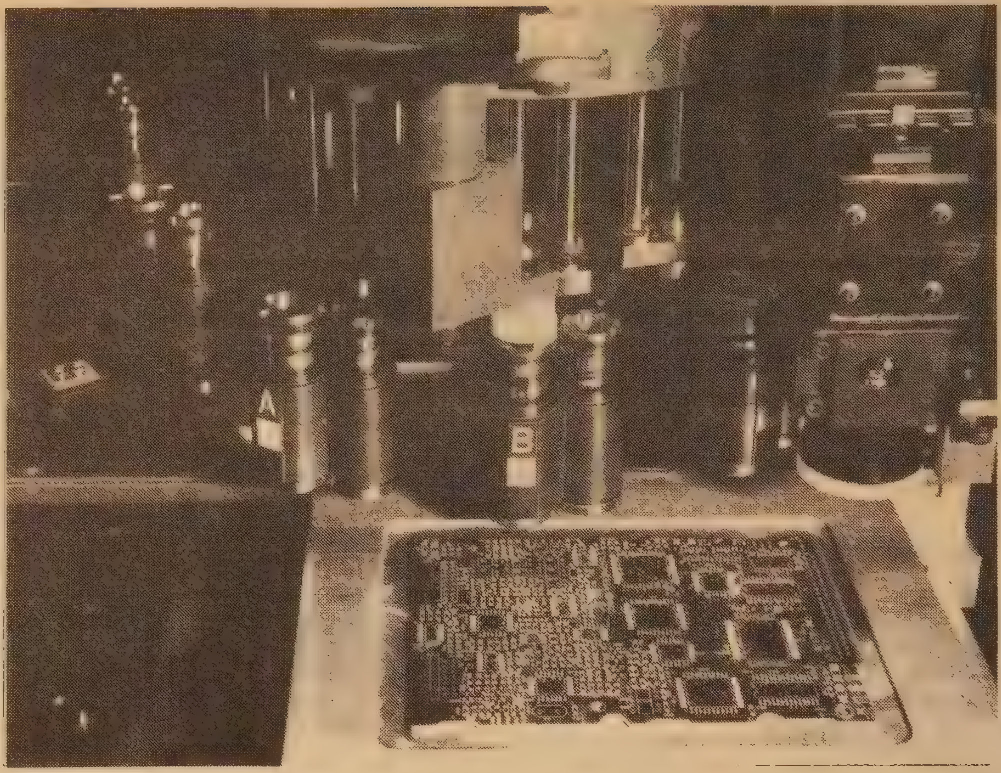

Circuit board production is a Solectron specialty

Hewlett-Packard, Silicon Graphics, emerging growth companies. About sixty-some percent of our revenues come from the service we do with printed circuit boards for these companies, surface mount technology particularly.

What is our mission? Our mission is to try and create one of the best manufacturing companies in the US. Actually in the whole world, because this country has been losing ground in manufacturing in the last twenty years, so we want to revitalize American manufacturing competitiveness.

Do you see that happening across the board, or particularly at the high-tech component level?

Well, we're in the high-tech area so I cannot comment on the rest of the industry. I'm somewhat involved in certain trade and competitiveness issues—our trade deficit last year was still $65 billion. It's coming down—it was $100 billion two years ago.

The auto industry trade deficit with Japan is $30 billion, autos and auto parts. But the electronics industry also had an $18.5 billion trade deficit with Japan last year.

The Japanese have created a lot of wealth through doing an excellent job in manufacturing. The strength of this country in several areas is in innovation, new product introductions. We're much faster in responding to market need than the Japanese.

We're strong in the area of software, we're strong in airplanes. The Japanese focus on the manufacturing side; they don't mind being second in introduction of new products, but they do a good job in production. Production, I would say generally, is a weak area in the United States, and that's what we focus on.

This company is not a typical Silicon Valley high-tech-product, fancy-sexy type of company. We don't design. We do the grunt work. Sometimes we do the work our customers don't want to do.

Do you do any design here, or take the customer's specs and build the product?

We do some portion of the design. Of course "design" is a wide spectrum—"design" can start from market concept and go into the whole product, conceptual design through IC design, printed circuit board design, system design. We focus on one portion—printed circuit board layout design. Some of our customers do their own in-house design, but we provide some service.

But that's not our particular strength. Our particular strength is manufacturing quality. On-time delivery. Good service. We handle a lot of frequent changes.

We are, in many cases, partners of our customers. Our customers focus on front-end design, product introductions, marketing, finance, and we support them on the manufacturing side. So when they finish the design, with our help, many times, they really hand over their manufacturing requirements—"This is the schedule, this is the design, this is the documentation. You buy materials, you manage inventory, you manage assembly, you manage testing." Sometimes we even manage distribution for our customers.

How do you account for the fact that you're so successful while so many other American manufacturers are either giving up or going offshore?

First of all, manufacturing is a tough business. It's tedious—you have to handle millions of details every day. It involves lots of people. It's hard to manage a big organization.

Also, in the typical high-tech company, they focus on innovation, design, marketing. Manufacturing is kind of the bottom of the totem pole. Where we're different is this is a manufacturing company. Manufacturing is our lifeblood, and therefore we focus on it, and we do well.

Our customers, high-tech companies, focus on product design, innovation. Usually they don't pay a lot of attention to manufacturing. Manufacturing people usually get lower pay, long hours, no prestige. But in this case, we're different.

Manufacturing is our number one priority. And we learn the best skills, the best techniques in the whole world, from American companies, from Japanese companies. And we help our customers by letting them focus on what they do best. Sun Microsystems can focus on their chip design, workstation, software, networks, and we focus on manufacturing techniques. So it's a partnership.

Also we provide a lot of service to large companies like IBM, Hewlett-Packard, Digital Equipment. Our cost structure usually is significantly lower than our customers', because we're a newer company and don't have a lot of overhead. We don't have fancy buildings—my office is there [points to an adjoining cubicle], and Ko's office. It's a democracy.

Cost is very important in our industry. So we can help our customers lower their production costs.

What percentage of your clients are US companies, and what percentage foreign?

The majority up to now still comes from American companies. So far probably 98% of our revenue this year is from the US. Next year our foreign revenue will increase, because we're in the process of globalizing our operation.

We have three thousand people in Silicon Valley; we set up an operation in Penang, Malaysia, about a year and a half ago. It's been in production about a year, and this year we ramp up to $12 million. Next year it'll be $30 or $40 million. In five years, the operation in Asia will probably be several hundred million dollars, because the market is growing quite rapidly there too.

We are working with one of our major customers to acquire their facility in France. If the deal is completed and we take over the facility, we'll have an operation in Europe, and that will create very rapid growth in Europe.

We have nine buildings in Silicon Valley—it's a relatively high-cost area. We focus on the high end of the market, essentially—mainframe computer products, disk drives, midrange minicomputers, workstations. We are not competitive at the low end, like small disk drives. Many of our customers move their facilities to Singapore, to Bangkok, or Malaysia, because it's one-quarter or one-fifth the labor costs here, and it's high volume. That's not our strong area. So the high end is the area we've been focusing on for thirteen or fourteen years, and we've been doing quite well as a company.

But right now we have reached the crossroad that either we stay as a domestic company or become a global company, and we decided to go ahead and expand globally. We set up a facility in Penang, and that's a huge market, actually bigger than the US market; we're also expanding in Europe, expanding in new technology as well as new extended service.

What do you see as the big challenges in that process?

Well, if you look at our history, we're a

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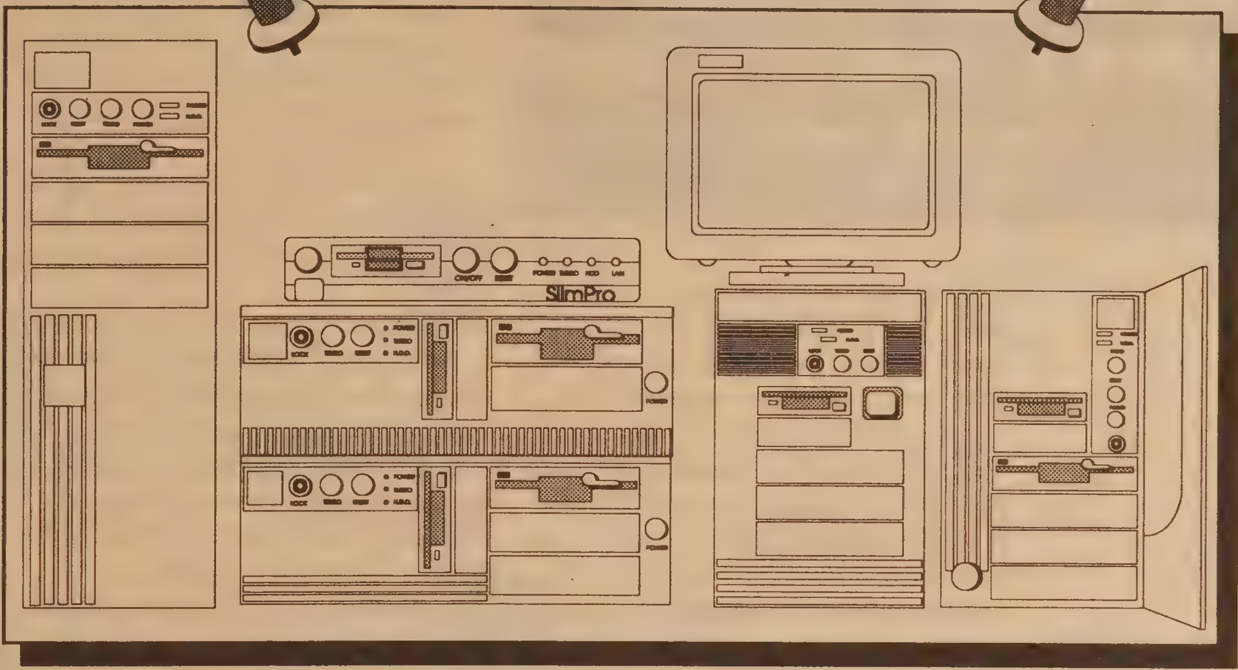

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relatively fast-growing company. This fiscal year, in the first six months, we grew about 90%. During a recession. Six months.

And at this kind of a growth rate, it's plenty busy, and we've got to make sure we continue to provide excellent service to our customers, maintain our quality, maintain our corporate culture. Basic values: focus on customer service; respect for our employees, helping them grow; quality, business ethics; create shareholders' value; create value for the community. When we grow in different locations, the challenge is, how do we continue to reinforce this basic value? Customers—how do you keep them happy all the time?

This company has a very unique culture. We all work very hard. We all care, to a great extent, about customer satisfaction and employee satisfaction. When we duplicate our system in Asia and Europe and the East Coast of the United States, can we have consistent value locally? It remains a big challenge for us.

Do you see the customers in the different markets wanting a different kind of product, or is it essentially the same thing around the world?

Absolutely not. We have about 80 customers. Our customers come from the workstation market, they come from the communications market, personal computers, low-end disk drives, mainframe computers.

In each segment, generally the requirement is very different. At the low end, cost reduction is so crucial, because they're in a low-margin commodity type of market. At the high end, it's quality, reliability, service—and their customers are willing to pay for it. At the low end, customers are not necessarily willing to pay for extra quality and service.

So we have to tailor our service to satisfy each different customer. We're a customized manufacturing service business.

A lot of clone dealers are in the situation where they're in a really low-margin, price-sensitive market, and yet if they cut prices beyond a certain point, the quality disappears and their customers don't come back. How do you handle that tradeoff?

In business, you have to choose your strategy. The conceptually simple form is "Do you want to run a company like Wal-Mart, or do you want to run a business like Neiman-Marcus or Nordstrom?" They're in a different business. You cannot say, "Well, I'm going to provide Nordstrom service at K-Mart or Wal-Mart's price." It's impossible.

So what we decided to do in the US is to focus on the high-end, Neiman-Marcus type of service. We provide extra value to our customers, by providing better quality, faster delivery, and closer service so we can respond to their market changes. Flexibility. Reduce the cycle of time, reduce the inventory. And that added value can justify the higher cost.

At the low end, we cannot do that. At the low end, there's a significant cost differential between here and overseas, so we cannot continue to cut the costs and still meanwhile maintain competitiveness. So in the US our strategy is that when the price is too low, we won't go into that market. We don't participate a lot in the clone business.

Overseas is different. We pick a location—Penang, Malaysia—that has a very good infrastructure, and the cost today is still relatively low. Labor is about $1.30 an hour—good workers, good management teams there.

So the idea there is we have excellent quality, because we duplicate the system here. We train the people there asking them to spend some time here and learn the system, then set up a system in Penang and meanwhile maintain the low cost there. I think there is a big potential for low-end types of products, clones, PCs, and disk drives, in Penang.

Is your management there local?

Yes. We hired and assembled an excellent management team. The general manager is a local. We sent a senior vice president from here to assist him, but eventually we'd like to have a very independent business.

This company really provides lots of intrapreneur environment, lots of intrapreneur opportunities for our people. How do we do it? We divide our company into smaller divisions. There's approximately ten divisions in the company. This year we'll be doing maybe $380 million in sales in ten divisions, and they can manage their own operation, service their own companies. They make as many decisions as possible at the divisional level. And also we let them share the profit—last year approximately 20% of our profit was distributed to the divisions.

Also many people in the company participate in stock ownership programs—several hundred people in the company own stock in Solectron.

When you went on the trip to Asia with President Bush, this was a result of the Baldrige Award?

Yes. This was the first time an American president took a business delegation team along with him. In the past our national priority was the Cold War, the Soviet Union. Luckily, those days are over. But most of the rest of the world puts the economy as its top priority, trade and competitiveness as a national priority. Not us, before.

But this is the right time for us to address this issue, so the president invited twenty-one business executives, including three Baldrige winners—Bob Galvan, the former CEO of Motorola, and Ray Marlow of Marlow Industries, a small company and winner of the Baldrige award last year, and Solectron.

I gather from your remarks elsewhere that you saw some difference between what the auto industry guys had to say and what the high-tech guys had to say, with regard to dealing with Asian markets in general.

Well, I think so. The car guys are under tremendous pressure—I think they collectively lost around $8 billion last year—and so they're in desperate mode. But in the electronics industry, the computer industry, we're quite confident. It's not easy, but if you look at high-tech industry, it's generally doing better than the Fortune 500. We're growing. The profit is not as great, but we're more confident, because we have new technology and we have a lot more strategic strength, in software particularly.

We also have some issues to address: We don't think the Japanese are playing a fair game.

How so?

In three areas. In the electronics industry, the Japanese public sector, the government, just doesn't like to buy foreign computers. In comparison, about 40% of the computers bought by the private sector were made by foreign companies. On the government side, they bought about 6% foreign computers. In the central government, they buy only .4%.

And government says, "Well, we're open to bids." They claim that American computer companies don't have enough patience, and it takes a long time to deal with government there.

Which is true. But on the other hand, there is a lock-in arrangement between the local Japanese computer companies—Hitachi, NEC, etc.—with the local public officials.

The second issue is that the semiconductor market in Japan is very difficult for foreign companies to penetrate. In 1986, foreign companies had only 8% market share there. The reason is not necessarily that foreign semi-

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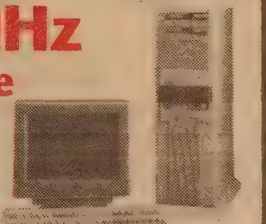

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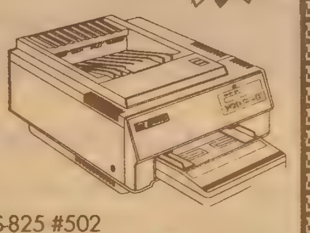

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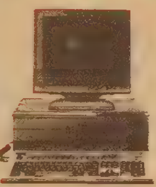

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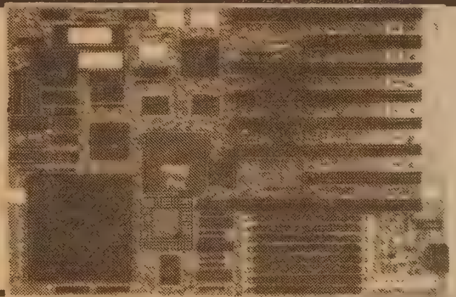

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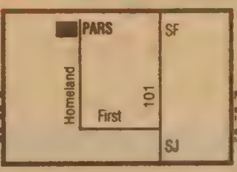

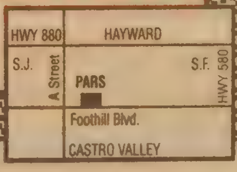

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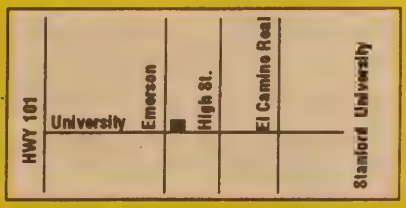

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Silicon Graphics, Sun Microsystems, Applied Materials—their biggest market is Japan, not the US. They're big in Japan for ten years. These companies have a unique technological strength, and the Japanese have to buy from them."

conductors are not good—some are better. But Japanese have the *keiretsu* system, so major computer companies buy from their subsidiaries.

Japanese companies say, "Well, that's true," and so they try to buy more. So last year foreign semiconductors were able to increase market share to 14%—it's stopped there for a while now. So we want to push them to buy more foreign semiconductors.

The third complaint we have concerns procurement of local components and services by Japanese companies in the US. Last year they procured only about 24% local content. In Europe, under local governments' pressure, they've procured about 44% local content.

American companies go to Japan, and we buy a lot of local content. So to be fair, they cannot just come here, set up their company, and buy from their Japanese suppliers from Japan. We want them to create jobs—we don't mind opening up markets to them.

The Japanese are agreeable, and they say they're trying hard. And of course they raise the concerns, particularly in the auto industry—with American cars, the quality is not that great, the driver is on the wrong side, it's too big, it consumes too much gas. Which I think is true. It's factual. But on the computer side, they've got to buy more.

Of course many American companies feel pretty confident. Some of our customers—Silicon Graphics, Sun Microsystems, Applied Materials—the biggest market for them is Japan, not the US. The US is second-largest. They're big in Japan for ten years. They're doing very well.

These companies have a unique technological strength, and the Japanese have to buy from them. When that happens, the Japanese are usually pretty open.

If you've got the right product, they'll buy it?

Right. The problem is if a Japanese company produces a comparable product—sometimes their government works with the private sectors to try to slow down the foreign company, or make it difficult for them to penetrate the market. Not through tariffs these days, but through inspections and all kinds of crazy things.

"Oh, you don't have the right kind of permit. You have to sit on the loading dock for two months."

That's right. And the metric system. "The packaging material is wrong." "The dimensions are off." Very idiotic things. Particularly when the Japanese government decides that this is a target industry, they try to buy time for Japanese companies to grow and catch up. That's a developing country's mentality, but they still have some of that. They're not really that open.

Look how long it took Toys R Us to open a store over there.

Yes, exactly. The bottom line is that you go to Japan and find that prices are very high on many, many things. Even if the tariff is low, the current structure of distribution is very difficult for foreign companies to penetrate. Whatever you want to sell to consumers, they have many layers of markups between the manufacturer and the customer. The dealers have a self-interest to protect the layers.

There are even laws against building big stores.

Yes. And so foreign companies say, "Hey, we don't need this middleman. We want to bypass that." But the law says you cannot do that.

Is Japan typical of Asian markets?

I think so. In terms of free and open markets, I think we're better than the whole world. We still have a lot of items like agricultural products that have some subsidy and some protection—we're not totally innocent either. But generally speaking, in terms of consumer products, in terms of industrial products, the US is the most open and free market in the whole world.

You go to Korea, Taiwan, they still have all kinds of tariff restrictions.

Do you see the solution as coming from the government side or the private sector?

Well, I think it's got to come from both. Certain things the private sector cannot achieve, like import limitation and tariffs, different types of artificial restrictions. Only government can do that for us.

I think the government side is trying hard. We've got to continue to put pressure on foreign governments to open up the markets. However they treat us, if they're not willing to change, we should treat them equally. If they don't want to open their markets, we should stop certain things and not be open to them. So we have things that sometimes are effective, particularly protection of intellectual property—in software copying, the rest of the world is still doing crazy things. We've got to just ask them and say, "Hey, be fair."

On the private sector side, absolutely we've got to continue to innovate faster and better than foreign companies. Quality has been a weak area in certain sectors of the market, like the auto industry—we just have to catch up.

I think the ultimate judges are the consumers. We let the consumers judge what they want to buy. In the last five years, Apple has sold a lot more Japanese-equivalent desktop computers—the consumer likes that. That's the American strength, and we've got to continue to push that.

Macintoshes do something in the Japanese market that no other system does, essentially.

Right. And that's American ingenuity, American innovation. We have lots of brain power.

So you see most of the barriers as being artificial rather than inherent in the products.

I think so. On this side there's a lot less artificial impediment—for example, cars. We love Japanese cars. We bought 3.6 million Japanese cars last year. Is that good or bad? I think generally that's good, because the consumer enjoys the best price. Of course the auto industry suffers, but the only solution is that they have to wake up and face up to the challenge.

Saturn's doing okay.

Cadillac is doing very well. Ford Taurus is doing well.

Basically I'd say what's happened in the last twenty years—it's not that Americans are that bad, we're okay. The problem is that the rest of the world is catching up really fast. And they work hard. They have lower-cost space. And the Japanese have such a strong dedication on the management side and the workers' side and the government.

I think the quality of work life is not good in Japan, so I think the government is not serving the workers that well in Japan. They've got to do a better job, and I'm sure when that happens, it's going to equalize more. But they still have a certain edge in manufacturing. In the last twenty years, many companies learned from Americans to begin with, and continued to perfect the manufacturing processes. And this country is kind of happy-go-lucky, "we're okay"—we don't improve that fast.

But it's changing. When I travel around the country, everywhere people recognize that the only future we're going to have depends on how quality and productivity are. People acknowledge that we have problems. And we want to do a good job. And I think we will. ■

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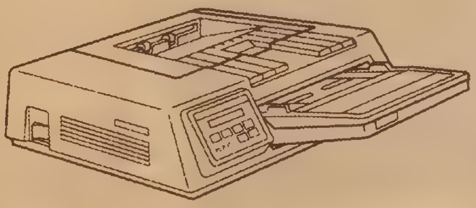

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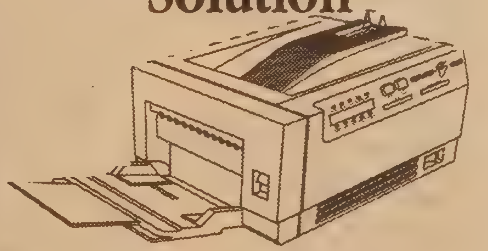

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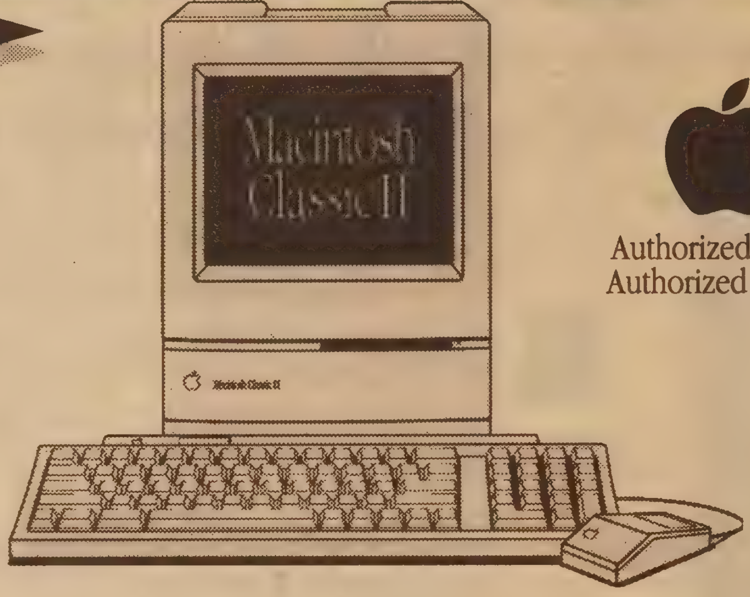

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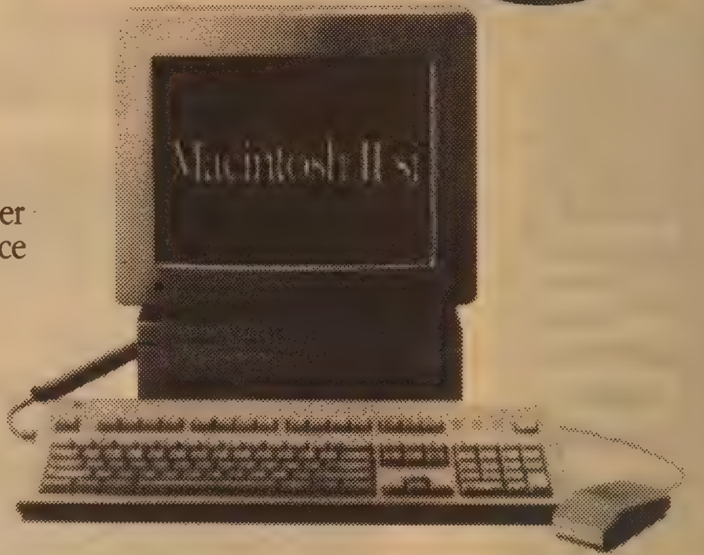

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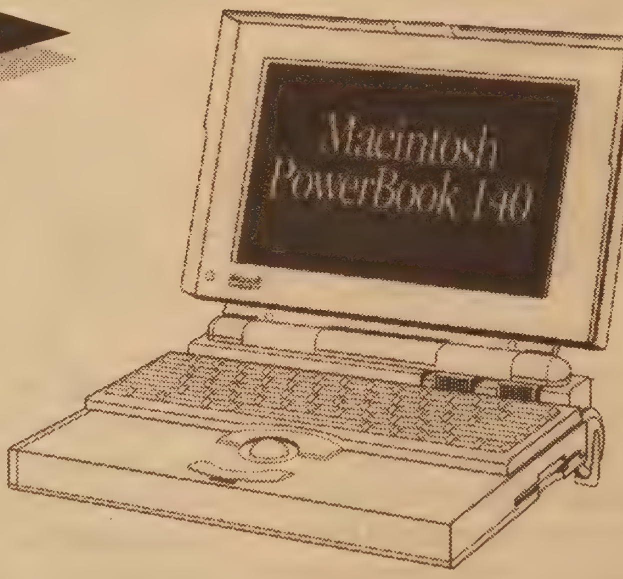

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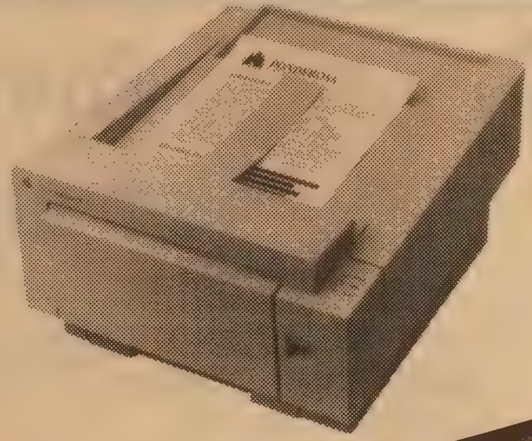

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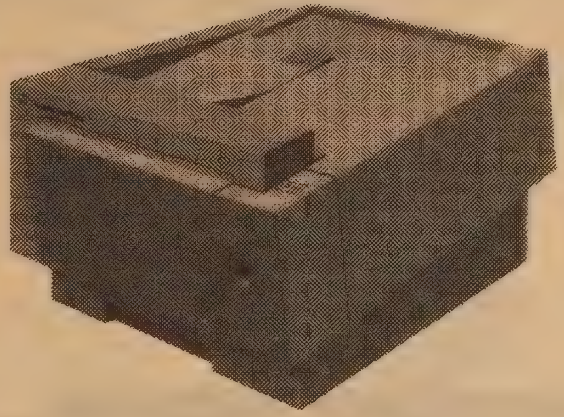

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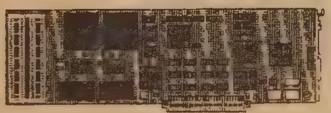

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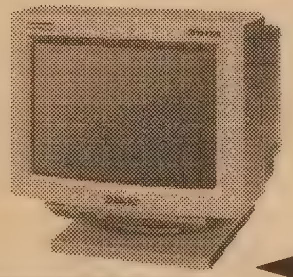

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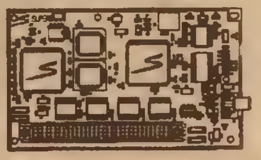

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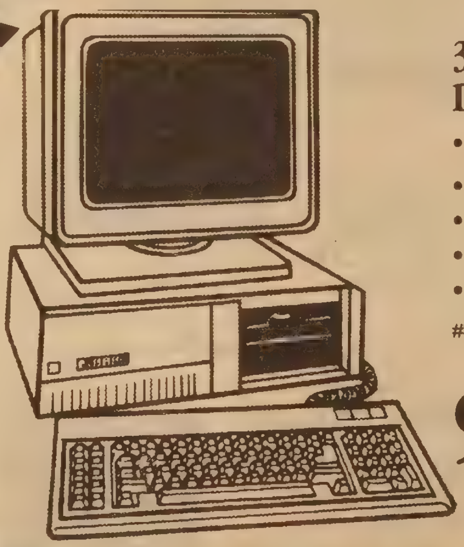

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- 85 MB HD
- VGA card and **monitor**
- DOS 5.0/Windows 3.1
- 1-year warranty

#SUPECA0012

1649.

Similar to illustration.

WATCH FOR OUR WINDOWS® WEEKEND

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ELECTRONICS

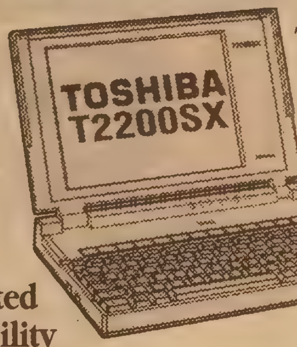
LAPTOPS

TOSHIBA

Toshiba T6400DX/SX

Save your eyes and fingers with a highly visible gas plasma, 16-grayscale VGA display and an ergonomically designed detachable keyboard. With choice of processors (486-33 or 486-25) and hard drives (200MB or 120MB), and 4MB of RAM, expandable to 20.

Limited Availability



Toshiba T2200SX/80

Now get state-of-the-art features in an ultralight 5.5 lb. notebook system. With a 16-gray VGA display, a 20 Mhz 386SX™ processor, 2 MB RAM expandable to 10, a 40 or 60 MB hard drive, and a 1.44 MB diskette drive, you'll forget all about your desktop computer.

2799.

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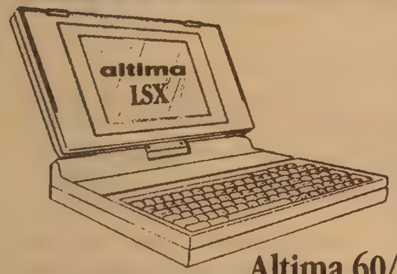
altima

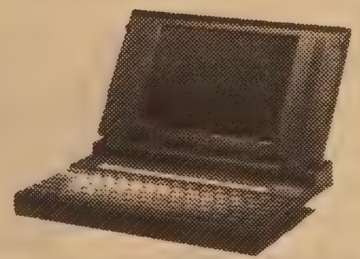


Altima 60/1- Fax

This serious professional's notebook comes with a 2400 baud fax/modem on-board to connect up to other computers or fax machines, a swift 386sx-20 Mhz processor, plus MS-DOS 5.0 and six software titles.

1699.

EVEREX



Everex

Low in weight and high in power, the Tempo LX 20Mhz 386sx notebook frees you from the bonds of your desk. Comes complete with VGA graphics, 1 MB RAM (expandable to 5), and a 60 MB hard drive.

1899.

Avanti 025

Avanti

25MHz 386SXL CPU • 2MB RAM expands to 8MB • 62MB hard disk • Fax send and receive modem • High contrast 10" LCD • Advanced power management • Pivoting screen • DOS, Windows, Carrying Case & more!

2699.

SHOP IN AN INFORMATIVE, NO-PRESSURE ENVIRONMENT.

TEXAS INSTRUMENTS

Texas Instruments TM2000/20

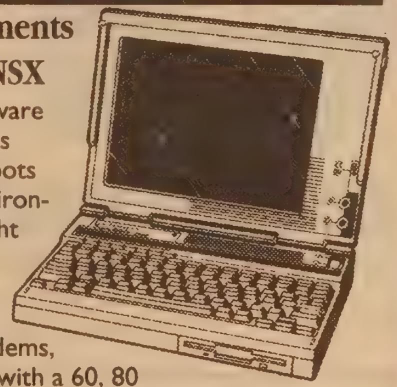
The in-demand VGA paperwhite display is standard on this super light 4.4 lb. notebook with a 20 MB hard drive, 286-12 Mhz processor, 1 MB RAM, DOS 4.01, and Laplink in ROM for swapping data with your home office.

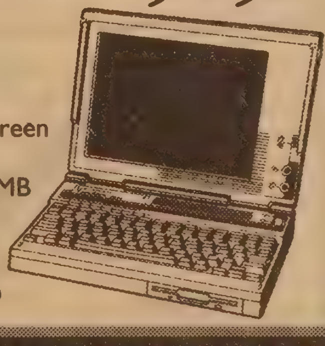
989.

Texas Instruments TM3000 WINSX

Baffled by software installation? Texas Instruments' friendliest laptop boots into the Windows graphical environment in less than 30 seconds, right out of the box. Includes extra-large cursors for high visibility and a battery power manager. Expandable to modems, fax modems, SCSI and Ethernet, and available with a 60, 80 or 120 MB hard drive.

Starting At **2999.**





Texas Instruments TI 3000

This 5.7 lb. notebook's bright 10" VGA screen will handle 32 grays—ideal for traveling presentations. With a 40, 60, 80, or 120 MB hard drive and 2 MB RAM (expandable to 6).

Starting At **2349.**

Texas Instruments 2400 T3000 Modem

Helps you stay in touch with the world. Receive or send your documents and data to/from home offices and clients.

Texas Instruments Memory Upgrades

Adding memory to your laptop is more affordable than ever. Increase the multitasking capabilities of your system, build more complex spreadsheets, and speed up memory-intensive operations.

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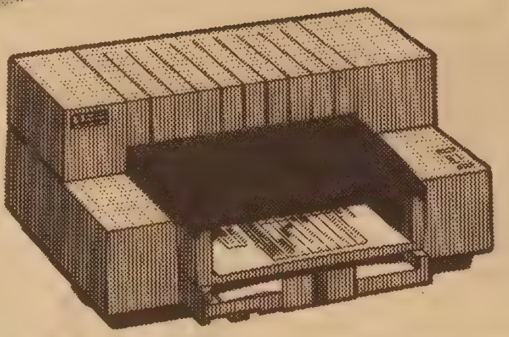
HEWLETT-PACKARD PRINTERS

WHOLE EARTH

Only one place on Earth makes

HEWLETT PACKARD

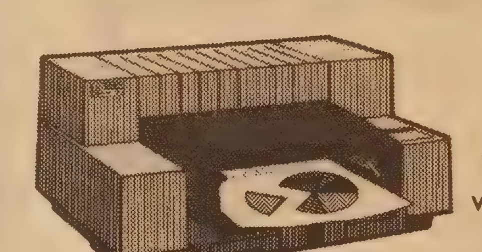


HP DeskWriter Printer

Get laser-like 300 dpi quality from your Apple® Macintosh® or AppleTalk® network, at a price lower than many dot-matrix printers. There's a good reason why these sell as fast as they come in.

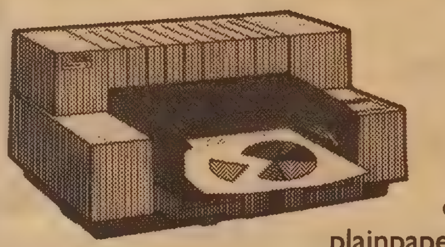
389.

IF YOU'RE NOT SATISFIED FOR ANY REASON, PLEASE LET US KNOW.



HP DeskJet 500 Printer

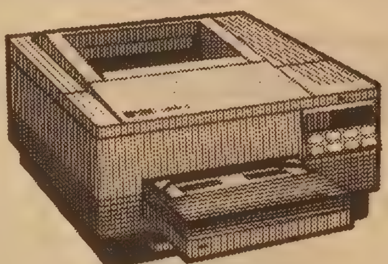
The DeskJet 500 has been hard to find, but we found some! DOS and Windows users can once again enjoy 300 dpi b&w printing at a small fraction of the price of a laser. Use it with your font-scaling software for beautiful documents. Limited quantity.



HP DeskJet 500C Printer

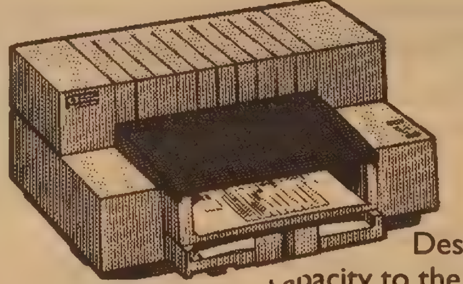
Get 300 dpi laser-quality color printing on plainpaper and transparencies, for persuasive design and presentation power at a fraction of the cost of a color laser printer. Supports all major software including Windows; 3-year limited warranty.

689.



HP LaserJet IIIP Printer

Whole Earth makes the super-advanced but hard-to-get LaserJet IIIP available again. It's compact but powerful, with faster print speed than other printers in its price range, plus built-in type scaling and upgradeability to PostScript for PC and Macintosh. Limited quantity.



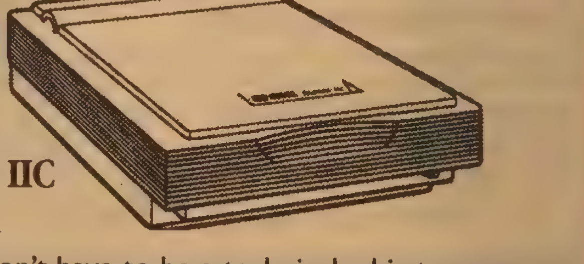
HP DeskWriter C Printer

The new HP DeskWriter C adds color capacity to the DeskWriter's already-famous laser-quality black output. It's compatible with popular Macintosh® software and your budget.

689.

HP ScanJet IIP Scanner

Scan images at 300 dpi resolution, or scan text using OCR software and stop typing it in. Exceptionally easy to use, and it works with most popular scanner software packages.



HP ScanJet IIC Scanner

Finally, you don't have to be a technical whiz to scan beautiful color images the first time. Scan in color or black-and-white with equal ease, or scan text and skip retyping hassles. 300 dpi resolution; supports most major scanning software.

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ELECTRONICS

your work look this professional.

Panasonic.

PRINTERS

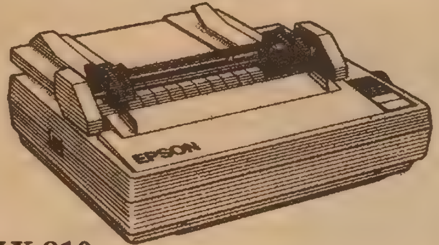
PACIFIC DATA PRODUCTS

Pacific Data Memory Products

Look to Pacific Data to upgrade your printer to the demanding standards of the 90's. Memory upgrades are cheaper than they've ever been—they're not just for power users anymore!

Starting At 129.

EPSON



LX-810

• 9 Pin • SmartPark™ paper handling • 200 CPS Super draft • 30 CPS NLQ • High resolution graphics.

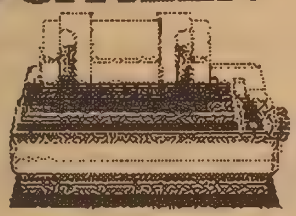
159.

2180i 9-Pin Dot Matrix

This extraordinary quiet dot-matrix printer juggles multipart forms and letters with equal ease. Choose from rear, top, or bottom paper feeding. 6 NLQ fonts in 9 sizes, 3 draft fonts, and a type-stretching capability.

199.

CITIZEN

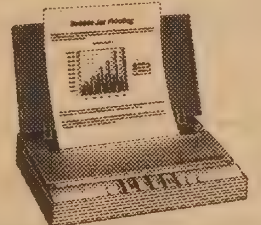


Citizen GSX-130
Color 24-Pin Dot Matrix

When color's important, the GSX-130 is about the best deal going. It prints crisp text in five fonts, and features advanced paper-handling that loves labels and lets you print on single sheets without removing your continuous tractor-feed paper. Perfect for home and educational use.

259.

Canon

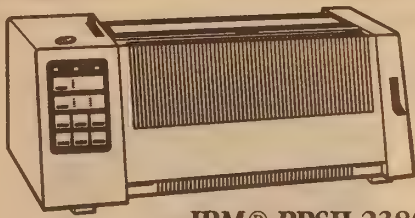


Canon BJ10ex BubbleJet

Canon's always one step ahead in printer technology, and this very portable 360 dpi bubblejet is no exception. Print laser-quality documents anywhere. Newly added Epson emulation works with your software's Epson printer drivers.

329.

LEXMARK Authorized Dealer



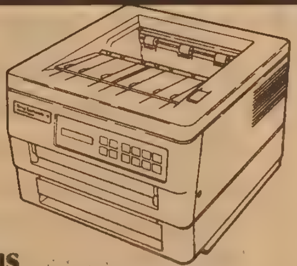
IBM® PPSII 2380

IBM's new 9 pin printers that can print crisp, six-part forms and thick paper stock with no problem using straight paper path technology. Solid and reliable, these printers perform flawlessly.

2380 Narrow carriage

349.

110% PRICE GUARANTEE



Texas Instruments MicroLaser Plus

From the company that made the pocket calculator affordable comes the MicroLaser Plus, one of the most reasonably-priced personal laser printers available. Its 9 pages per minute is more then twice that of other comparably priced printers, and it's HP LaserJet-compatible.

899.

TEXAS INSTRUMENTS

Texas Instruments MicroLaser XL

Tuck this compact printer under your shelf or desk and ram through complex documents at up to 16 blazing pages per minute. The MicroLaser XL's straight paper path handles heavy stock and transparencies without balking, and it's adaptable to work with any Apple® or DOS computer. Easily upgradeable to Adobe® PostScript.

2399.

Texas Instruments MicroLaser Turbo/RISC

The smarter RISC processors you've heard rumors of are here today in the MicroLaser Turbo with PostScript level 2, helping you cut your print time to as low as a sixth of the time ordinary PostScript printers take. The straight-through paper path lets you use all kinds of paper and stock; automatic emulation switching and port switching means it's perfect for mixed-platform networks.

Call

Texas Instruments AppleTalk Adapter

Connect your DOS printer up to an AppleTalk network to get perfectly printed pages from your Apple® Macintosh®.

Texas Instruments Legal Tray

Stop wasting your time changing paper trays! Handle mixed-size documents or varied documents in a queue without leaving your chair.

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The first computer to understand you don't just have a job. You have a life.

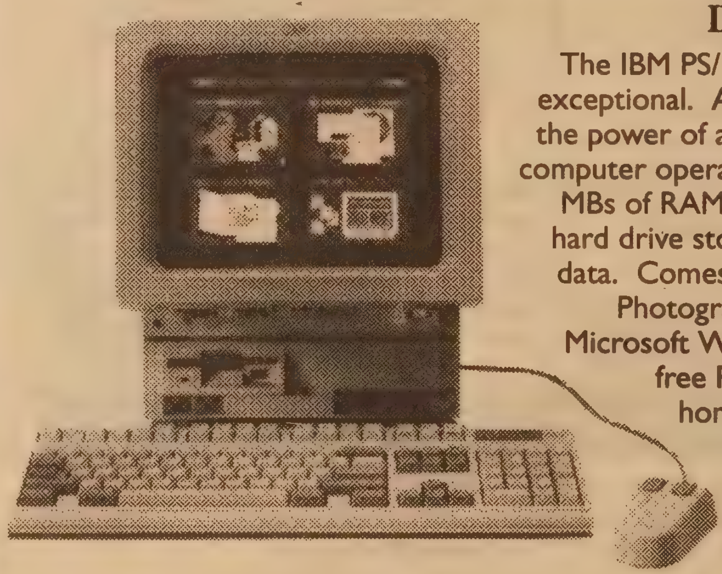
IBM® PS/1 386SX-20 model 2123's

This processor lets you finish even complex jobs on time and with style. Note the 14-inch low-emission VGA color monitor. And under the case, the chameleon-like 2123 crams three expansion slots, a bay for an extra 5-1/2" drive, and 2 MB of RAM (expandable to 16).

Includes:

- Internal Modem
- 3 free months Prodigy on-line service
- DOS 5.0 (pre-loaded)
- Microsoft Windows 3.0
- Microsoft Works for Windows
- IBM Mouse

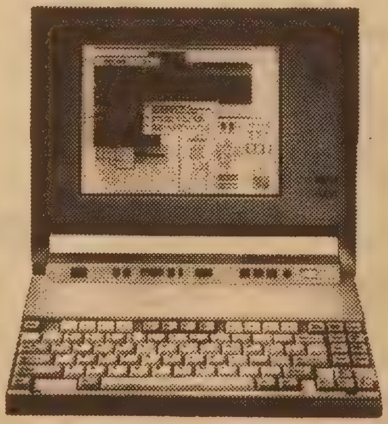
1695.



IBM® PS/1 386SX

The IBM PS/1 386SX achieves the exceptional. A home machine with the power of a business model, this computer operates at 16 mhz with 2 MBs of RAM. A 40 MB or 80 MB hard drive stores all your essential data. Comes complete with VGA Photographic™ color display, Microsoft Works® and 3 months free ProdigySM for on line home shopping, banking, travel arrangements and more.

1495.



IBM® PS/2® L40SX

Full featured, fast and flexible, the L40sx is IBM's new no-compromise notebook PC. 2MB of RAM expandable to 18 MB, VGA display, 20 Mhz 80386sx processor and 60 MB hard drive make this system an outstanding choice for the business traveler.

2999.

Now Whole Earth has OS/2

▼

The IBM software development team in Boca Raton, Florida burned the midnight oil to bring you this new standard in system software. The first officially IBM-developed system for personal computers, OS/2 is an actual graphic point-and-click operating system, not just an add-on graphic environment. It features lots of online help, superior network and relational database support, and the built-in ability to run several DOS and/or Windows applications at once, as well as cut and paste data between both kinds of software. Stop by Whole Earth and try out OS/2 2.0. You'll never look at your computer in quite the same way.

▼

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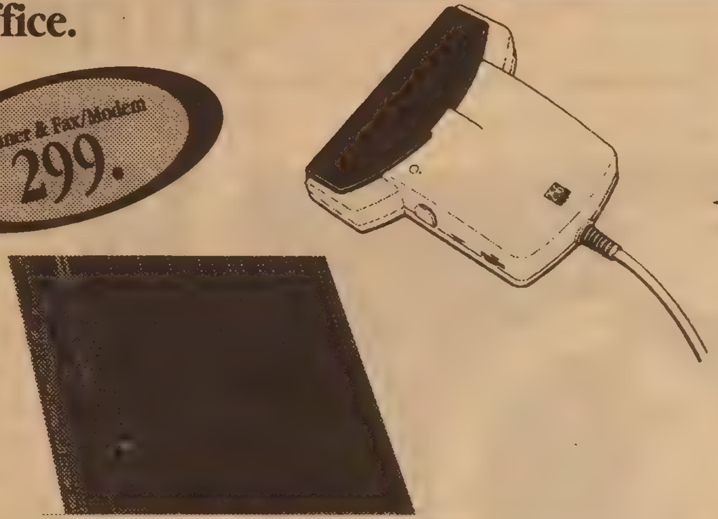
ELECTRONICS

HOME/OFFICE

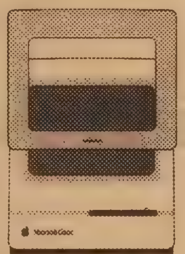
We found what's been missing from your office.

If you've considered getting a fax/modem or scanner but you've been procrastinating, here's your chance to get both at the price you'd normally pay for just one: the Macronix Fax Solution bundle. Fax documents directly off your hard drive, or scan hard copies instead of typing them in—even edit them with the included OCR software. The Macronix MaxFax II board also functions as a data modem so you can get online to your favorite computer bulletin boards or send documents in data form. And with the Marstek scanner's 400 dpi resolution and 3 halftone modes, you can scan and fax photos and drawings—a must for anyone in real estate, sales, or the arts! The possibilities are truly endless, but this deal isn't, so take advantage of it now and squeeze the most out of your computer.

Scanner & Fax/Modem 299.



KENSINGTON

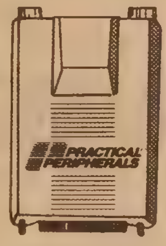


Glare Screen for the Apple® Macintosh® Classic®

Help prevent eyestrain and the fatigue that can come with computer radiation. All a glare screen!

49^{95}

PRACTICAL PERIPHERALS



Practical Peripherals

Pocket 2400 band data modem for DOS users. No battery needed.
5 year warranty.

119.

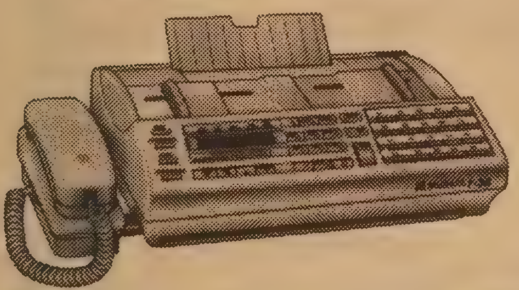
BY Leading TECHNOLOGY INC.

2400 Baud Modem

Get into computer-to-computer communications with your basic modem at a very basic price. It's 100% Hayes-compatible and made to last. Internal and external available.

Starting at 79.

MURATA



Multitasking Business Fax with Cutter and Memory

- The Murata F-38 delivers high volume fax features in an affordable, compact and easy to use productivity tool.
- Sixteen pages of document memory eases sequential fax broadcasting up to 70 locations and saves valuable information if you run out of paper.
- Multitasking program memory saves money and time enabling one person's fax to be entered while anothers is sent. Five delayed operations for after hours faxing reduces long distance bills.
- Generates activity journals automatically every 25 transactions plus confirmation reports on each fax. The F-38 provides vital documentation for managing fax usage.
- You can connect your answering machine to your fax because the F-38 pre-recorded voice prompt assists callers in faxing and message taking.

699.

SHARP

Sharp 240

If your business is part of a chain, the 240's ability to send instructions to an intermediate fax to relay a document to machines near it can save you big money on long-distance phone bills. It's got auto fax/voice switching, an answering machine hookup, a 10-page doc feeder, and can handle 16 shades of grey for detailed photo faxing.

549.

HEWLETT PACKARD

HP Palmtop 95LX

The pocket-sized case with a price to match. Top-selling spreadsheet Lotus 1-2-3 is built right in, along with an appointment book and a memo/note processor. Data can be exchanged via phone with the optional Connectivity Pack, or wirelessly via paging services.

after $100 rebate 399.

Canon

Canon Starwriter 70

Canon pulls another trick out of its seemingly bottomless bag with this shamelessly beautiful word processor that boasts a 360 dpi bubblejet printer, 5 fonts in 5 styles and 12 sizes each, a WYSIWYG LCD display, a floppy drive for storage, and a spell-checker/thesaurus.

499.

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Digital World Conference June 23–25

Beverly Hilton Hotel, Beverly Hills

DIGITAL MEDIA

Whether you're a multimedia professional, a would-be user, or somebody who's just trying to figure out what all these techno-toys mean to real people, the place to find out is the Digital World conference, returning to Beverly Hills on June 23.

In the Demo Center, you'll have a chance to see the latest innovations in use, and get ideas for how they might be applied to the requirements of your particular project. This year, practical sessions will also address the needs of digital-media professionals.

The conference schedule features panel discussions by the industry leaders who create the technology and the leading-edge professionals who use it.

For more information, contact Seybold Seminars at 1-800-777-6650 or (310)457-8500.

Practical Sessions

PS120

BROADCAST QUALITY VIDEO IN A BOX

Paul Grimshaw, *Calypso Films*
Steven Mayer, *Digital F/X*
Curt Rawley, *Avid Technology*
Lee Stranahan, *NewTek, Inc.*
Scott Billups, *VizNet Productions*
Moderator: Michael Shaughnessy

PS130

MULTIMEDIA PLATFORM SHOOTOUT

Conducted by Hal Josephson, *MediaSense*
Dave Lundberg, *Tiger Media*
Bob Sorenson, *Optimage*
Jim Griffith, *Media Learning Center*
Larry Samuels, *Creative Labs*
TBA, *Apple*

PS150

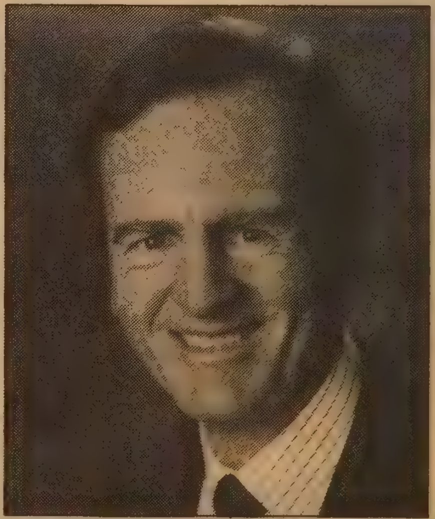
ANIMATION, COMPUTER-GENERATED MOVIES, AND VIRTUAL REALITY

Brad Pollard
Douglas MacLeod, *Banff Center for the Arts*
Steve Glenn, *Simgraphics*
Steve Segal
Additional speaker TBA
Moderator: Lynda Weinman

Tuesday, June 23

OPENING SESSION: ERASING THE BOUNDARIES

9–11 am, 11:30 am–1 pm
Richard Green, *CableLabs*
Andrew Grove, *Intel*
Lucie Fjeldstad, *IBM*
John Sculley, *Apple Computer*
Ron Sommer, *Sony Corporation of America*



Apple's John Sculley joins other industry leaders in the Digital World opening session, "Erasing the Boundaries."

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SEMINARS

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Windows Series

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Plus :

- ☐ 4 MB 70n sec Ram, Expandable to 32MB
- ☐ Tseng Lab ET4000AX with 1 MB (1024x768 x 256 Colors, 1280x1024 x16 Color
- ☐ 14" Non-Interlaced SVGA Monitor (Up to 1280x1024, 0.28mm)
- ☐ Teac 1.2MB and 1.44MB Floppy Drives
- ☐ 2 Serial & 1 Parallel Ports
- ☐ Enhanced 101-key Keyboard
- ☐ Choice of Desktop or Mini Tower Case
- ☐ Free MS-DOS 5.0 (OEM) with Manual
- ☐ Free Windows 3.1(OEM) w/Manual and Mous

System Cache	386/33C 64K	386/40C 128K	486/33C 64K	486/33C 256k	486/50C 256k
105MB	1358	1378	1688	1728	2078
130MB	1408	1428	1738	1778	2128
205MB	1608	1628	1938	1978	2328

June Special

- ☐ 4 MB Ram
- ☐ Teac Floppy Drives (1.2MB and 1.44MB)
- ☐ AMI BIOS w/Clock & Calender
- ☐ 2 Serial & 1 Parallel Ports
- ☐ Choice of Desktop or Mini Tower Case
- ☐ Enhanced 101-key Keyboard
- ☐ Trident 16 bit SVGA Card w/1M (Up to 1024x768 x 256 colors)
- ☐ 14" SVGA Monitor (0.28mm)

System Cache	386/25	386/33C 64K	386/40C 128K	486/33C 64K	486/33C 256k	486/50C 256k
105MB	1128	1158	1178	1468	1508	1858
130MB	1178	1208	1228	1518	1558	1908
205MB	1378	1408	1428	1718	1758	2108

Word Processing Series

- ☐ 386SX/25 Motherboard
- ☐ 2 MB Ram
- ☐ Teac Floppy Drives (1.2MB and 1.44MB)
- ☐ AMI BIOS w/Clock & Calender
- ☐ 2 Serial & 1 Parallel Ports
- ☐ Choice of Desktop or Mini Tower Case
- ☐ Enhanced 101-key Keyboard
- ☐ 16 bit SVGA Card
- ☐ 14" SVGA Monitor

40MB	80MB	105MB	130MB
858	939	949	999

Motherboards : (No CPU, 0KB Ram)	
386SX/16 w/CPU	$140
386SX/25 w/CPU	$150
386/25DX	$120
386/33C (64K Cache)	$150
386/40C (128k Cache)	$170
486/33C (64K Cache,ISA)	$150
486/33C (256K Cache,ISA)	$200

Video Cards:	
Mono Graphic w/Parallel Port	$20
Paradise OEM w/256K	$69
Paradise OEM w/512K	$89
Trident w/1MB	$78
Tseng Lab ET4000 w/1MB	$109
Orchid Pro-Designer IIs w/1MB Sierra	$168
Orchid Fahrenheit 1280 w/1MB	$248

Monitors:	
Mono 12"/14"	$75/ $100
Mono VGA 14"	$125
SVGA 14 " (1024x768 0.39dp)	$235
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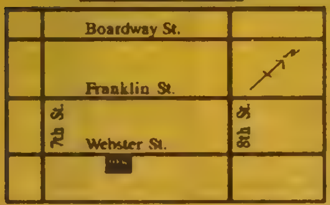

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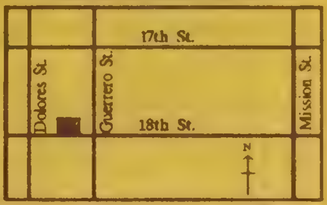

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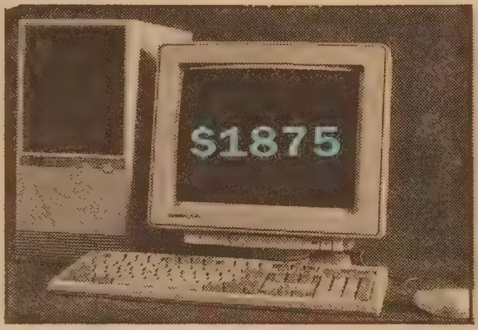

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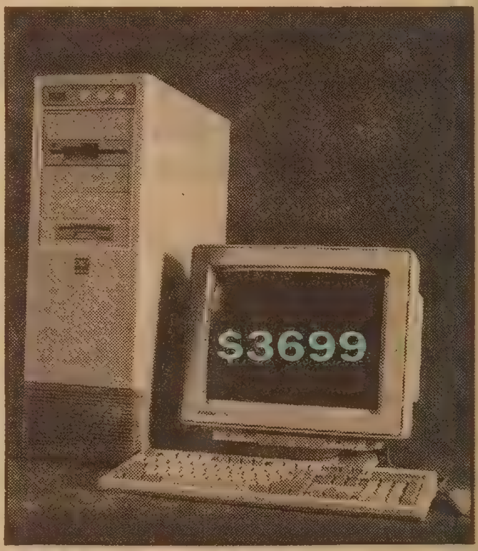

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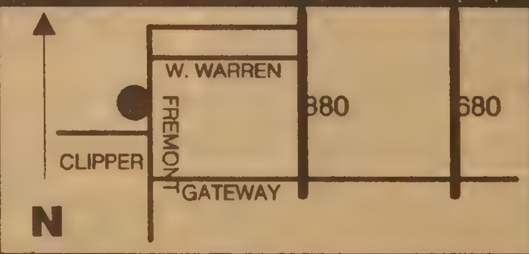
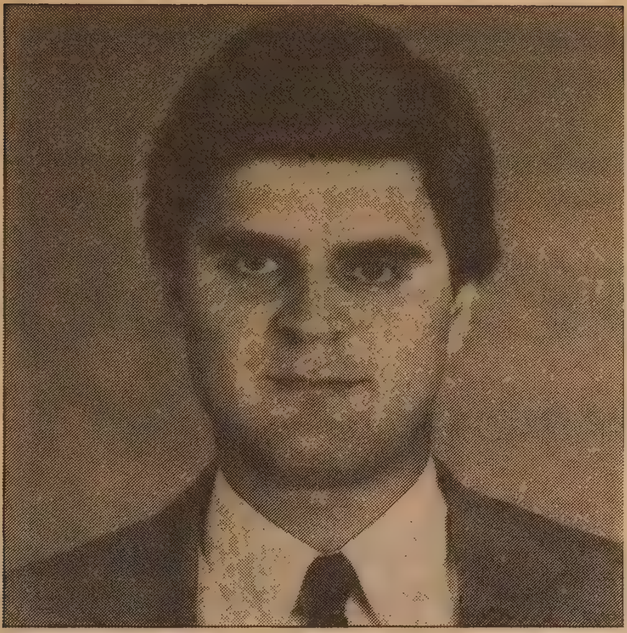




America Online president Steve Case is a panelist discussing "The Telephone Company: Public Network or Information Provider?"

THE TELEPHONE COMPANY: PUBLIC NETWORK OR INFORMATION PROVIDER?

2:30–4 pm

Ken Thomson, RBOC representative TBA

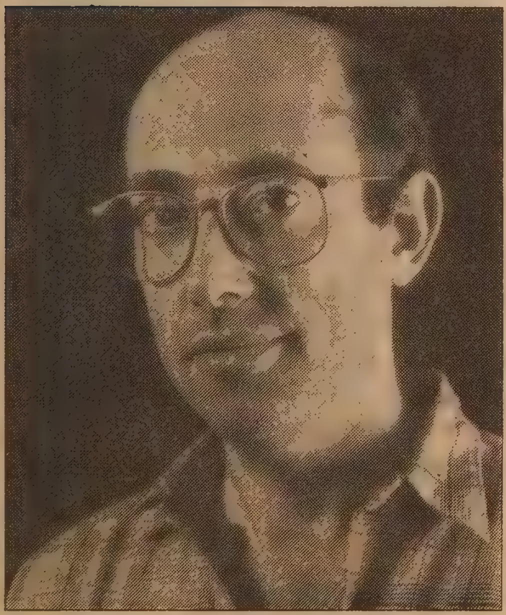
Respondents:

Steve Case, *America Online*
Harry Morris, Brewster Kahle, *WAIS*
David Knight, *Isocor*

THE NEW CONSUMER DEVICES: A NEW CLASS OF PRODUCT

4:30–6 pm

Koji Hase, *Toshiba Japanese Corporation*
Avram Miller, *Intel*
TBA, *Matsushita*
TBA, *Kaleida*



Voyager's Bob Stein is a participant in "The Great Television Debate" at Digital World June 23

THE GREAT TELEVISION DEBATE: AN INFORMAL BULL SESSION

7:30–9 pm

Bob Stein, *Voyager Company*
Christopher Cerf, *Christopher Cerf Associates*
Suean Ambron, *Simon & Schuster*
John Perry Barlow, *Electronic Frontier Foundation*
Kathleen Tyner, *Strategies for Media Literacy*
Diana Gagnon Hawkins, *Interactive Associates*

WEDNESDAY, JUNE 24

INTERACTIVE TELEVISION

9–10:30 am

Diana Gagnon Hawkins, *Interactive Associates*
Marc Dillon, *GTE Imagitrek*
Ed Horowitz, *Viacom International*

MULTIMEDIA COMPUTING: IS INTERACTIVITY ALL IT'S CRACKED UP TO BE?

11 am–12:30 pm

Douglas Crockford, *LucasArts, Inc.*
Max Whitby, *The MultiMedia Company*
Allen DeBevoise, *AND Communications*
Elizabeth Young, *Warner New Media*
Greg Roach, *Hyperbole*

CABLE, CELLULAR AND SATELLITE: THE "OTHER" INFORMATION NETWORKS

2:30–4 pm

Dick Brass, *Oracle*
Terry Hershey, *Time Warner*
Rick Selvage, *SkyPix*

Respondents:

Robert Rosenberg, *Insite Research*
Mike Grubbs, *Tandy*

NEW MEDIA AND ART

4:30–6 pm

Michael Century, *Banff Center for the Arts*
Abbe Don, *artist*
Rick Smolen

THURSDAY, JUNE 25

LOCATION-BASED ENTERTAINMENT: THEME PARKS AND VIRTUAL ENVIRONMENTS

9–10:30 am

Scott Billups, *VizNet Communications*
Brenda Laurel, *Telepresence Research*
Sally Rosenthal, *big Research/Magic Box Productions, Inc.*

TECHNOLOGY AND EDUCATION

11 am–12:30 pm

TBA

PROTECTING AND VALUING INTELLECTUAL PROPERTY

2:30–4 pm

John Perry Barlow, *Electronic Frontier Foundation*
Barbara Zimmerman, *BZ Rights*
David Nimmer, *Irell & Manelle*
Bruce Polichar, *IMA Intellectual Property Task Force*

CLOSING SESSION

4:30–6 pm

Nathan Myhrvold, *Microsoft*
John Evans, *The News Corporation*
Mike Leibhold, *Apple*

New Improved OS/2

Still Not Ready For Prime Time

BY PAUL HOFFMAN

OS/2 2.0
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I write this with very mixed emotions. Anyone who has seen my many online postings in the last few months knows that I've been bending over backwards in favor of IBM and OS/2 v2. I really felt that a "real" multitasking operating system's inherent advantages over Microsoft Windows were a compelling reason to keep our minds open and give IBM a chance. I did, waiting for a final release of OS/2 before trying it.

Well, OS/2 is technically better, but still very disappointing.

One might expect the next line to be, "You gotta give IBM some credit for trying." But you don't, because they didn't try very hard in most areas other than in the programming code itself. IBM is treating OS/2 2.0 like a mainframe product: they'll sell it to you, but small users can't get very good service. Of course, on an operating system as big as OS/2, service is very important. Many parts of OS/2 don't work right; IBM doesn't know why, and doesn't know when they'll be fixed.

Given OS/2's dark-horse position, IBM needed to go the extra mile to get the attention of The Average Buyer. They didn't. Instead, they targeted OS/2 2.0 almost exclusively at their current mainframe and minicomputer users, who are familiar with waiting days and weeks for responses to help requests. Most IBM corporate customers have in-house help facilities; when a problem arises, users must consult the in-house help, insulating IBM from having to deal with mundane questions. However, when you want to sell an operating system to everyone, you'd better be ready for anything. No one ever gave Microsoft awards for their telephone support of Windows, but they have nothing to fear from IBM.

INSTALLATION

No doubt you've heard about how much hard disk space OS/2 takes. The 3.5" version comes on *twenty-one* high-density diskettes. You actually only have to load seventeen of those for a typical full installation (the last five diskettes are printer drivers).

One of the first things you notice jammed next to the box of diskettes is a sheet of cute OS/2 stickers. Shades of the Macintosh! If you want to proudly profess your allegiance to OS/2, you can stick these on your car, on your software, and so on. After you start running OS/2, you may decide not to plaster them everywhere, though.

In addition to the big box of diskettes, there are over a dozen small books, pamphlets, and miscellaneous sheets. Ominously, the small book titled *Installation Guide* is the fattest. In fact, it is longer than the *Using the Operating System* book. Not a good sign. The good news is that if you plan to run OS/2 on a system that already has MS-DOS and do not intend to run other operating systems such as UNIX, the installation process is straightforward. This is called "Adding OS/2 2.0 to a DOS System (Dual Boot)," not to be confused with "Boot Manager," which requires much more work.

The installation went quickly and easily. The questions asked were fairly direct and easy to answer. (One humorous note is that you must do the installation from your A: drive. If your system has both 3.5" and 5.25" drives, you must be sure to get the OS/2 for the type of drive you have as A:.) After the installation, I had a surge of confidence in OS/2. IBM clearly put a great deal of effort into getting the installation process right.

If you have lots of hard disk space free, you should install any feature that you want from the very beginning. You can add items later, but you will discover that the setup program is fairly brain-dead: you have to insert each of the last eight diskettes, even if what you are adding is only on one of them. My initial favorable impression of the installation program was shot down by this one. Clearly, IBM had not tested this thoroughly.

> **IBM is treating OS/2 2.0 like a mainframe product: they'll sell it to you, but small users can't get very good service. Of course, on an operating system as big as OS/2, service is very important.**

DRIVER PROBLEMS

A surprising number of hardware add-ons for PCs require *drivers*—software that makes MS-DOS know how to deal with the hardware. Many software programs are installed as drivers, usually in your CONFIG.SYS file. OS/2 v2 requires drivers as well, but IBM did not spend nearly as much time on getting drivers for OS/2 as it should have. This glaring omission made me realize that OS/2 came from the same "It isn't important if it wasn't invented

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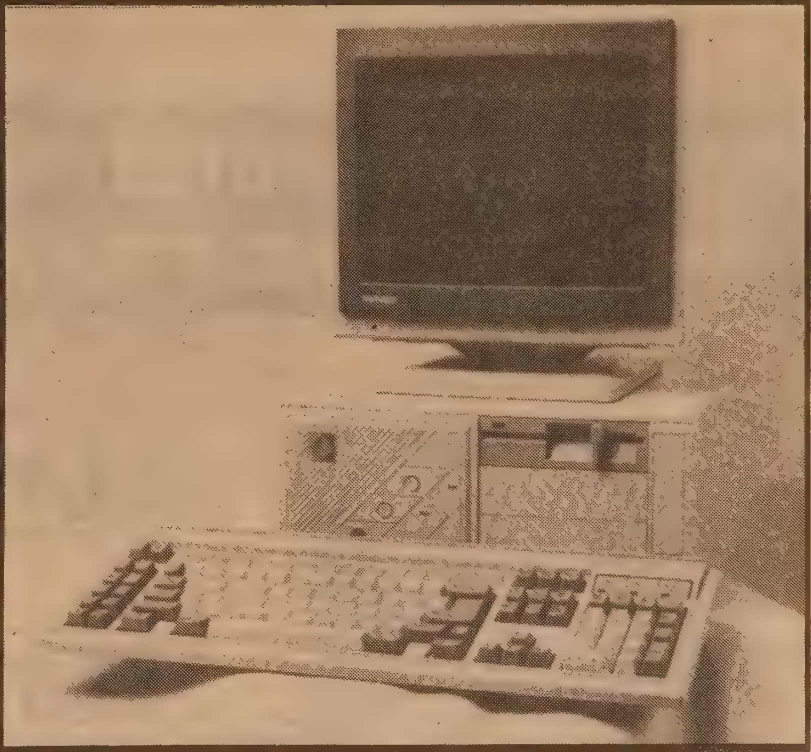

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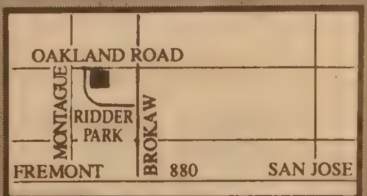

here" attitude as the PCjr.

Millions of people use disk compression programs to save space on their hard disks. The most popular, such as Stacker from Stac Electronics, are installed as drivers and control the way programs look at your hard disk. Unfortunately, none of them supports OS/2 yet. Stac says it will have a version of Stacker for OS/2 by the end of this year, but that leaves people who are already using the MS-DOS version unable to access their files under OS/2. Other popular hardware, such as printer redirectors, also doesn't work under OS/2.

You might think of blaming Stac for this tardiness, but it is really IBM's fault for not supporting developers earlier with OS/2 development kits and even programming expertise. If IBM had pushed the important companies towards OS/2 last year instead of waiting until it was released, companies like Stac would have had drivers ready to go.

Even worse, many of IBM's own hardware drivers don't work well. For example, I have a SCSI drive for my PC in addition to the PC's internal IDE drives. Although IDE drives are by far more popular for consumer PCs, SCSI drives are very popular for high-end systems such as network servers. I use the major brand of SCSI controller (Adaptec) and the major brand of SCSI drive (Quantum), and have never had any problem with the drive under MS-DOS.

There are dozens of irritating flaws in OS/2. Although none of them is fatal, they all point to the fact that IBM was primarily thinking about corporate users, who have a computer support and training staff to smooth out the wrinkles for them.

After I started OS/2 v2 the first time, I noticed that it did not recognize my SCSI drive. I assumed that it hadn't installed the driver during the automatic installation and that I might need to do it manually. I opened the Master Help Index, searched for SCSI, and found no entries.

Disheartened, I called the 800 number for customer service. I did get through to someone within a minute (as compared to the normal fifteen-minute wait on a toll call to Microsoft), but the scene turned very dark very quickly.

The woman asked for my customer number. I said I didn't know what it was and asked where I would find it. She didn't have a clue. I told her I just bought OS/2 and had looked everywhere for any serial number. She said she couldn't take my problem report without a customer number. I asked again where to find it and she put me on hold so she could ask. When she came back she said that it should be on the box. I was looking at the box and told her, no, there was nothing personalized there. After another few minutes on hold, she said she would take my name and number and a description of the problem and someone would get back to me. When I told her I was having a problem with a SCSI drive (and I spelled it out), she said she had never heard of a SCSI drive.

No one called back. I needed to get the review written, so I pulled some strings with the PR agency that sent me the copy of OS/2. Within a few hours, I was talking to a customer support programmer. I told him that OS/2 didn't see my SCSI drives and I didn't know what to do. He said, "I've never used a

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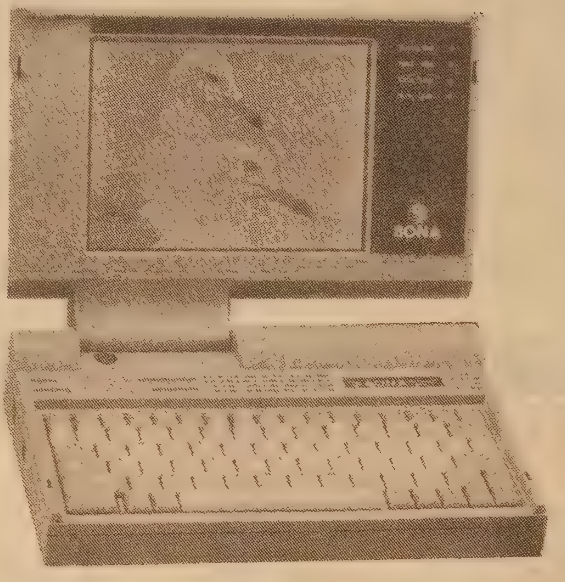

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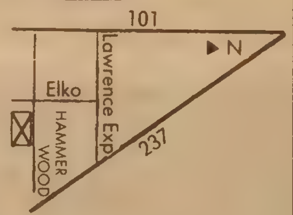

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SCSI drive before. Are you using an IBM SCSI drive?" No, I replied, I'm using a controller from Adaptec. "Have you tried calling them?"

It was starting to look bleak. He asked if I had looked in the READ.ME file, which I had not. Lo and behold, there was information in there about Adaptec SCSI drives, indicating that I had to install the driver myself. The person at IBM hadn't read the READ.ME file either, and had little understanding of the steps outlined.

To make a long story short, it turns out that the OS/2 installer had already installed the SCSI driver, but it didn't work. One out of every five times that I booted OS/2, it would see the SCSI drive, the other four times it wouldn't. The customer support person promised to find more information on why this was, but couldn't.

THE USER COMES LAST

The problems I had with IBM's customer support are typical of the old IBM attitude that the corporate customer wants their product, so they don't need to support the individual customer very well. The shocking idea that I didn't have a customer number boggled the first customer support person's mind, but the prevalence of this attitude is clear even if you have no problems installing OS/2.

When you want to sell an operating system to everyone, you'd better be ready for anything. No one ever gave Microsoft awards for their telephone support of Windows, but they have nothing to fear from IBM.

Windows 3.1 has lots of little features that many of us take for granted, at least until we run OS/2. There is no screen saver in OS/2. Many people like to arrange their icons in a particular orientation on their screen; if you accidentally choose to sort the icons in OS/2, there is no way to undo the change. Even the interface on the Dual Boot program, the one that lets you also boot under MS-DOS if you want, is incredibly cumbersome. If you run it with no arguments under MS-DOS (which you might, if you couldn't find the documentation for it), the program gives you an error message in IBMese instead of telling you what you want to do.

There are dozens of other irritating flaws in OS/2. Although none of them is fatal, they all point to the fact that IBM was primarily thinking about corporate users who have a computer support and training staff to smooth out the wrinkles for them. For instance, the first time you double-click on the icon for a Windows program, instead of running the program, OS/2 gives you a "C>" prompt. After about ten seconds, the program runs. Until then, however, you have no idea what you're supposed to do. I tried typing at the prompt, but got nowhere.

This is not to say that OS/2 2.0 is unusable, just unpleasant. Microsoft has nothing to worry about from IBM here. Any advantage that IBM had by getting OS/2 2.0 out ahead of Windows NT was squandered by its lack of understanding of the average PC user. Even the software companies that created OS/2 programs are upset at IBM for not helping them market their software to OS/2 users: IBM didn't even invite many of them to the OS/2 release meetings.

If IBM continues to treat its customers and suppliers like this, Microsoft can turn out even more mediocre software and still dominate the operating system industry easily. ■

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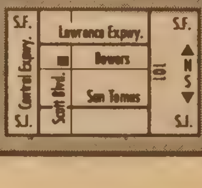

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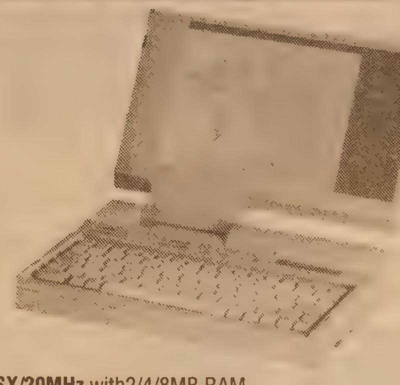

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Discs & Drives

To Accompany Its CD-ROM Drives, DAK Industries Offers CD-ROM Disc PAKs At Substantial Savings

BY WOODY LISWOOD

Prices for computer equipment is almost always a critical issue, especially with CD-ROMs. DAK, building on its experience and knowledge gained in the consumer electronics market, presents some good deals in prices, as well as a good deal for its technology.

DAK offers a BSR CD-ROM drive. However, other than a BSR logo on the front panel, this is a Sony 6201 CD-ROM unit. The 6201 uses a 40-pin bus that the technical support folks called a "super fast serial port" but the documentation labels as a SCSI port. More importantly, it connects like a SCSI port and you can daisy chain up to four devices. This drive reads CD-ROM Mode-1 and Mode-2 data discs, CD-Audio discs, and combined audio and data discs.

Although BSR is not a "known" brand name in the computer industry, they do all of DAK's computer assembly and purchases—in many ways acting as a captive manufacturing and assembly house.

Along with the CD-ROM drive itself, DAK provides complete installation instructions, a special program that runs the CD-ROMs, and a music launcher program that lets you play audio CDs through your computer. DAK provides its own installation and operation instructions for all of its CD-ROM products. This documentation, while not fancy, assumes that you don't know what you are doing, and offers a general overview of how everything works, as well as step-by-step instructions. The documentation is written in a breezy, but direct, manner.

The packaging also includes three booklets supplied by Sony. One is for the drive and contains the documentation, specifications, and description of the CD-ROM hardware unit; another is for the high-speed Sony interface and explains how to set the jumpers for various memory addresses; and the last is for the MS-DOS CD-ROM extensions.

The CD Launcher program lets you select and load any of your CD-ROM discs or the Music Launcher program. When you purchase a disc bundle from DAK, they are automatically installed into the CD Launcher, but you can add additional discs to the Launcher at any time. The disc choices available are displayed in a dialogue box and can be selected through the mouse or arrow keys.

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One of the major frustrations in the CD-ROM arena has been the extremely high costs of individual CD-ROM databases. DAK has gotten around this by bundling CD-ROMs in packages and offering these specially priced packages only to owners of their CD-ROM hardware units.

Actually, you can install each of the CD-ROMs yourself, but the menu system and launcher make this easier. My only complaint with the installation of the launcher is that the CD Launcher is automatically placed in the root directory while the music player and discs were installed in their own subdirectories. Everything was resolved after I modified it so that the launcher was in a separate subdirectory and each of the CD-ROM products was in children subdirectories of the launcher directory, making it easier to keep track of everything.

DRIVING YOUR CD-ROM DISCS

Accompanying your purchase of the DAK CD-ROM drive is Microsoft's Bookshelf CD-ROM library (consisting of The American Heritage Dictionary, Roget's Electronic Thesaurus, The Concise Columbia Encyclopedia and World Almanac, and Bartlett's Familiar Quotations and Concise Columbia Quotations), as well as the Family Doctor and Front Page News CD-ROMs.

To use a disc is easy. If you did the normal DAK installation, just type CDMENU, select the Bookshelf menu item, and follow the instructions. After placing the disc into the CD-ROM drive, the Bookshelf software takes over. One of the options is to load the software as a TSR so that you can access it through your DOS-based word processor. After you find what you want, copy it to a clipboard; you can insert the selected information into a document or save the information as an ASCII file on your hard drive.

The Music Player, which comes with the CD-ROM unit, has an excellent on-screen representation of the controls for an audio CD player and with a few mouse clicks you are enjoying the music. For comparison, I've used Music Box, the Windows Multimedia software, and both Music Box and Music Player work equally well. I like the screen for Music Player better than the controls for Music Box.

The Music Player lets you play your audio CDs using your CD-ROM drive. You should either have earphones handy to plug into the CD-ROM drive, or a stereo sound board that is connected to a pair of amplified speakers, or a board attached to your stereo system. Since one of the CD-ROM bundles from DAK is a collection of multimedia discs, I suspect that DAK will be offering their own multimedia sound setup before long.

CD-ROM BUNDLE PAKS

One of the major frustrations in the CD-ROM arena has been the extremely high costs of

Continued on page 226

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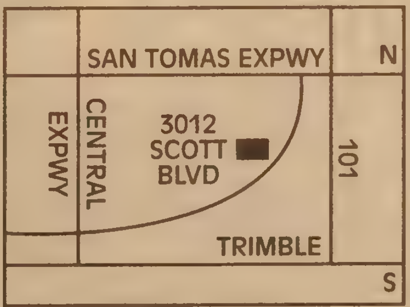

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386-33MHz

64K Cache w/4MB RAM

LandMark	Norton SI
50.3	40.1

- 4MB RAM, 5.25" & 3.5" FDD
- **CONNER** 120MB Hard Drive
- **VIEWSONIC** 6 VGA Monitor
- **TRIDENT** VGA 1024 w/ 1MB
- MS-DOS 5.0

$1488

- 80386-33MHz CPU,
- 4MB RAM on-board exp to 32MB
- AMI BIOS • 6 16-bit expansion slots
- AT case w/220watt power supply

386-40MHz

64K Cache w/4MB RAM

- 4MB RAM, 5.25" & 3.5" FDD
- **CONNER** 120MB Hard Drive
- **VIEWSONIC** 6 VGA Monitor
- **TRIDENT** VGA 1024 w/ 1MB
- MS-DOS 5.0

$1548

- 80386-40MHz CPU,
- 4MB RAM on-board exp to 32MB
- AMI BIOS • 6 16-bit expansion slots
- AT case w/220watt power supply

LandMark	Norton SI
62.4	49.1

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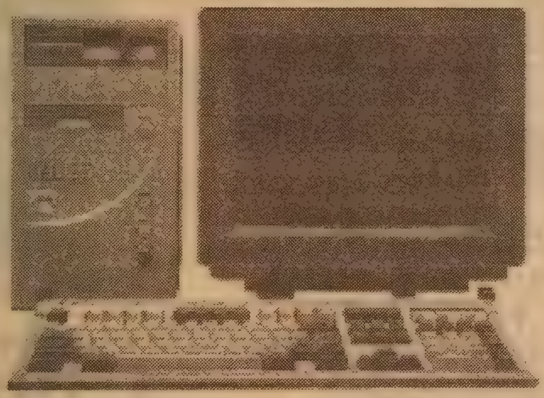
486-33MHz

64K Cache w/4MB RAM



- 4MB RAM, 5.25" & 3.5" FDD
- **CONNER** 120MB Hard Drive
- **SONY** 1304S VGA Monitor
- **ORCHID** ProDesigner IIs w/ 1MB
- MS-DOS 5.0

$2138

- 80486-33MHz CPU, 0 wait state
- 4MB RAM on-board exp to 64MB
- AMI BIOS • 8 16-bit expansion slots
- Tower case w/220watt power supply

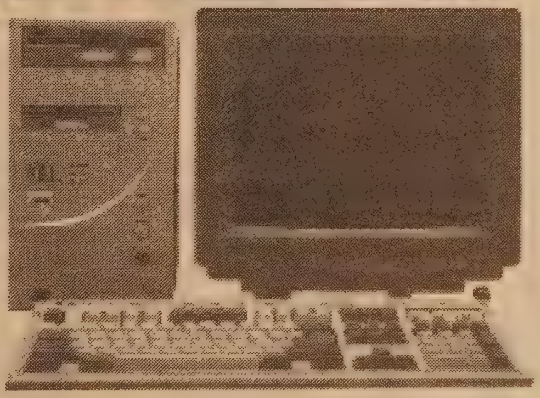
LandMark	Norton SI
120.12	51.4

486-50MHz

256K Cache w/4MB RAM

- 4MB RAM, 5.25" & 3.5" FDD
- **CONNER** 120MB Hard Drive
- **SONY** 1304S VGA Monitor
- **ORCHID** ProDesigner IIs w/ 1MB
- MS-DOS 5.0

$2598



- 80486-50MHz CPU, 0 wait state
- 4MB RAM on-board exp to 32MB
- AMI BIOS • 7 16 & 1 32-bit expansion slots
- Tower case w/220watt power supply

LandMark	Norton SI
180.28	108.1

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IBM, AT & XT compatible

Software Titles include:
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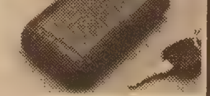

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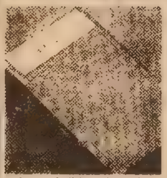

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60MB HDD Notebook

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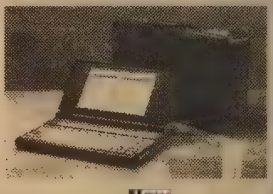

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Super NB386S

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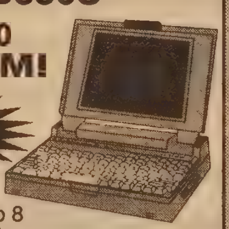

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- DOS, GW-basic, FastLynx

40MB $1599

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60MB

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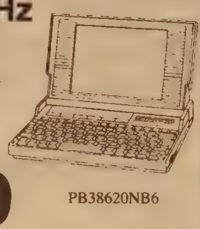

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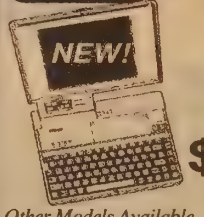

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w/ 64KB Cache

4 MB RAM

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- Prints up to 83cps
- Text & graphics up to360dpi
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Identical to Canon BJ 10ex

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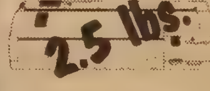

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Includes Battery & case!

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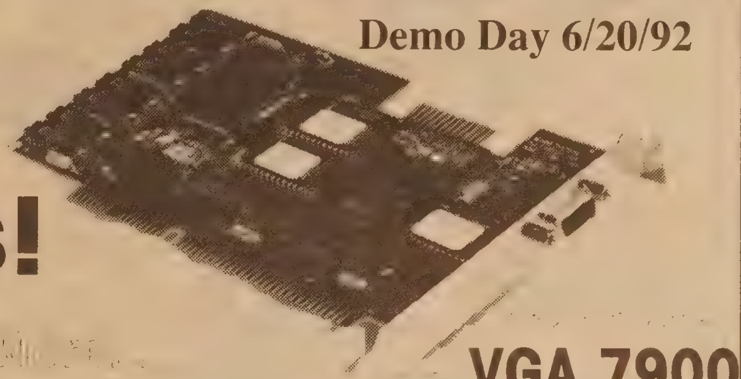

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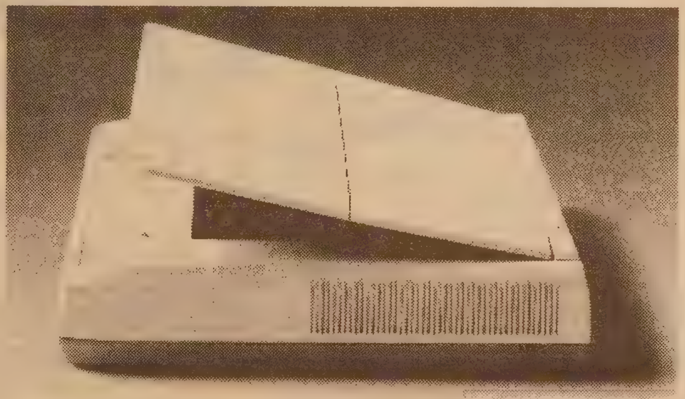

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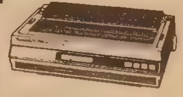
Quiet 24-pin Color Capable

43.5 dBA!



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- Color option available
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KX-P4410

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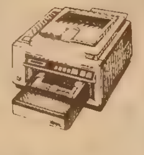

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- 512K RAM exp to 4.5MB
- 250 sheet paper capacity
- 300 dpi resolution • 5 PPM

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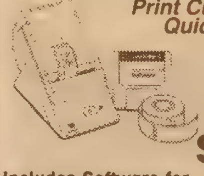
Print Custom Labels Quick & Easy!



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Includes Software for Bar Code 39 & 2 of 5 built-in!

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Includes AppleTalk Interface!

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- 24-pin, 315cps
- 12 built-in fonts
- 2 year warranty

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LQ-1070
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- **WIDE Carriage**
- 2 year warranty

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LQ-510	$229
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FX-850	309
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KX-P2624 ***Come Hear the Difference!***

Quiet Printer

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- 300cps, 100cps LQ
- 11 fonts, 26K buffer
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KX-P1124i	289
KX-P1695	348
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POSTSCRIPT

KX-P4455 PostScript Laser

Accessories for 4455/4450i	
Legal Tray	$49
Envelope Tray	69
Toner	39
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Developer	99

- 2MB RAM exp to 4MB
- 500 sheet paper capacity
- 39 PostScript fonts • 11PPM

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- 10 ppm, **1MB RAM** exp. to 7.5
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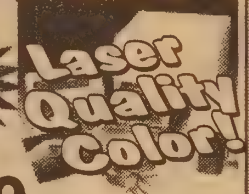

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- 35 fonts, PANTONE color capable

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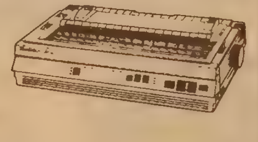

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KX-P1524	24-pin wide-carriage	199
KX-P1624	24-pin wide-carriage	259
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- 1MB DRAM w/Sierra Chip Set
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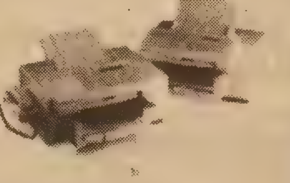

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32-level grayscale, 12-page memory

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32-level gray, 512K exp. to 2MB

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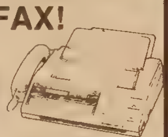

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2501P

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- Resolution control
- And Much More...

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- Full 3 watts of power
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Panasonic

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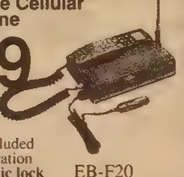

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- And much more...

EB-F20

NEC

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P301

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- **Any key answer**
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- And much more...

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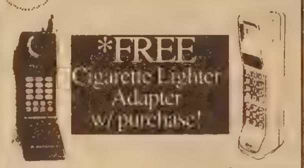

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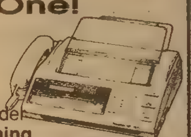

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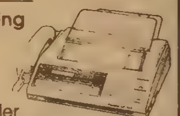

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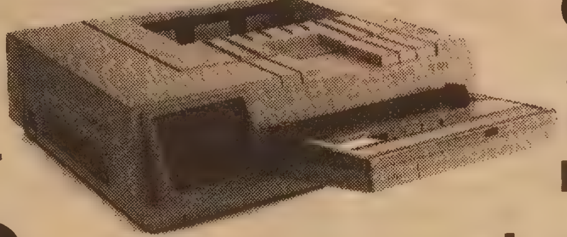

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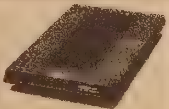

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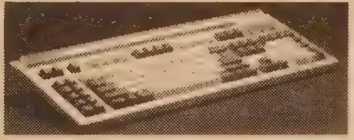

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Additional Storage Space Without Adding A New Hard Disk

SuperStor Software Gives Transparent File Compression For All DOS Applications

BY LENNY BAILES

More hard disk space is a commodity sought almost universally by anyone who uses a personal computer. But adding a new hard disk is also a pain in the wallet. SuperStor, from AddStor, Inc., is a software-only disk compression package that increases the available space on your old drive in a range from 20 to 300%. Version 2.0 of SuperStor is now compatible with MS DOS v3.1 to 5 or Digital's DR DOS 6 (formerly, AddStor had separate packages for use with Microsoft and Digital operating systems). The new SuperStor achieves a slightly higher compression ratio than older versions, and includes a set of utilities for optimizing a compressed drive, and recovering data from a damaged volume. You can also use SuperStor to create compressed "transportable floppy" diskettes readable on systems that don't have SuperStor installed.

Products like SuperStor (and Stacker, the chief competitor) are generally perceived as "doubling" the amount of hard disk space you'd have without them. The actual amount of extra space that you get depends on the "compressability" of the files you store on the drive. SuperStor adds storage space to a drive by writing its files to a "compressed volume." The compressed volume masquerades as another logical drive, but is really just a compressed file that resides on your existing drive. The SuperStor drive is similar to what you would get if you used PKZIP to copy all of your files to a giant archive. Only with SuperStor, you don't have to manually pack and unpack the files to work with them; the SuperStor device driver does that for you, on the fly. DOS sees the SuperStor volume as a logical drive on your system. Your applications see the compressed volume as an ordinary logical partition. The result is that you can cram an average of 35 to 40MB worth of files onto a drive that really contains 20MB of space.

With some limitations, SuperStor compressed drives are transparent to all DOS applications. (You can't use one to store a Windows swap file, and you may have to be careful in the way you configure a disk cache.) The amount of time spent actually compressing and decompressing files is negligible.

Text files and bitmapped graphics like PC Paintbrush, Encapsulated PostScript, and TIFF files are the most compactible. If you store these files on a SuperStor "compressed" drive, you may achieve compression ratios of 300% or better. Binary program files are reduced in size 30 to 40% when compressed; PKZIP files and CompuServe GIF graphics are hardly reduced at all. If you fill a SuperStor volume with ZIP files, you may not wind up with an actual storage space advantage.

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addstor

SuperStor works by placing a device driver in your CONFIG.SYS. The driver allows you to allocate part of the space on an existing drive for a SuperStor volume, or to automatically convert the entire drive. If you convert the entire drive, it is recognized automatically when DOS loads the device driver. If you convert only part of a drive you have a choice between activating it automatically on bootup or creating a "mountable disk" that is turned on from the DOS command line. This procedure is fairly straightforward, unless you have only one logical drive on your system and want to compress it all. DOS doesn't know how to read files on a compressed drive until the SuperStor device driver is loaded, so you can't really use your entire boot drive for a SuperStor volume. SuperStor automatically stores your CONFIG.SYS on a small uncompressed portion of the drive. If you intend to use a memory management utility, such as Quarterdeck's Optimize or 386MAX's Maximize, you must manually reserve uncompressed space on your boot drive to hold these files.

The "portable compressed floppy" feature is a welcome addition to SuperStor 2.0. While, again, the storage space on a floppy may not actually double, you will probably be able to get around 1MB of storage space on a 720K diskette, or 1.8MB on a 1.2MB diskette. You can insert these diskettes on a system without SuperStor, and use them on a read-only basis.

Some technical considerations: AddStor advises against using disk optimization utilities from packages like PC Tools or the Norton Utilities on a SuperStor volume. The package includes AddStor's own defragmenter and disk repair utility to be used in place of the third-party products. The SuperStor device drivers use about 52K of RAM and can be loaded into upper memory, either completely, or in part, if your computer has UMB load high capability. ■

Continued on page 231

RESOURCES:

SuperStor, v2.0, $139
AddStor, Inc.
3905 Bohannon Dr.
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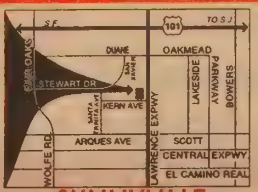

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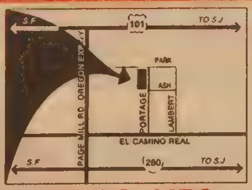

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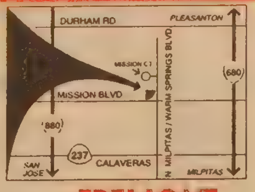

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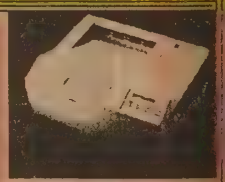

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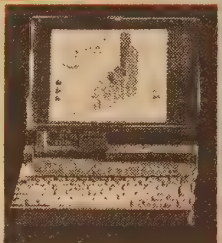

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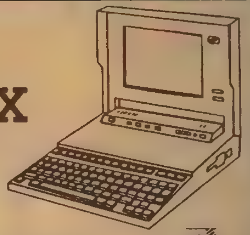

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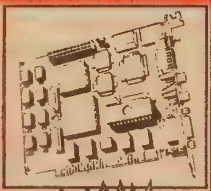

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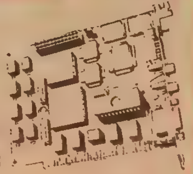

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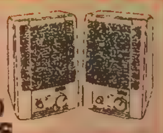

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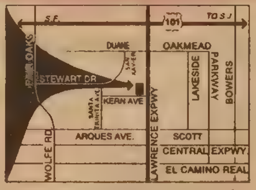

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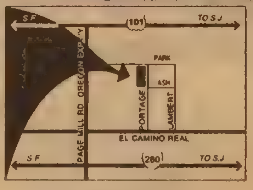

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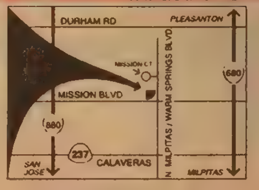

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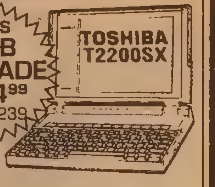

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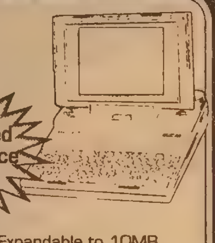

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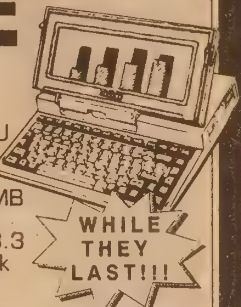

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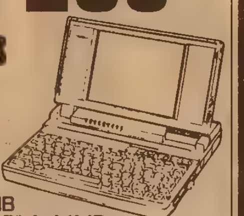

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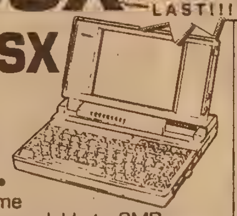

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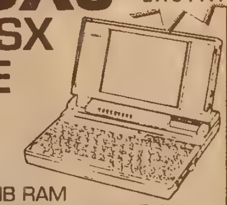

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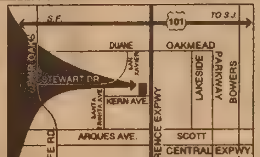

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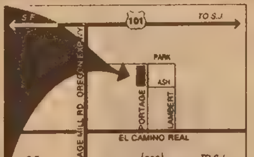

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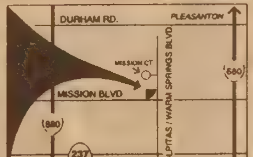

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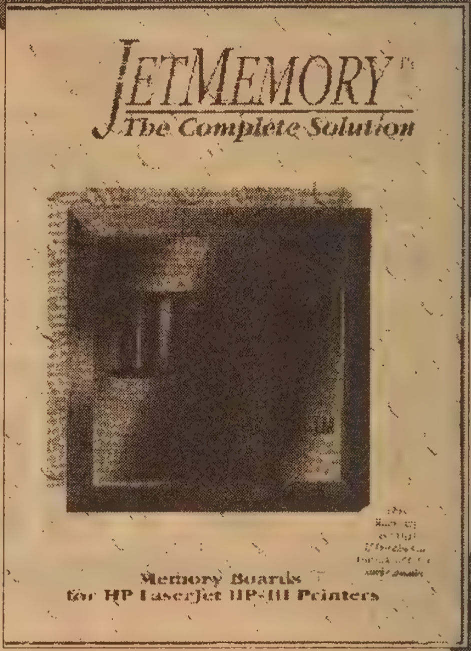

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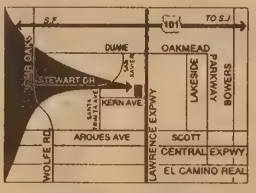

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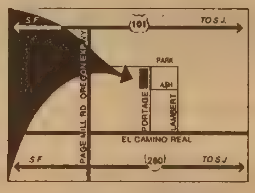

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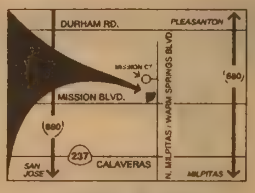

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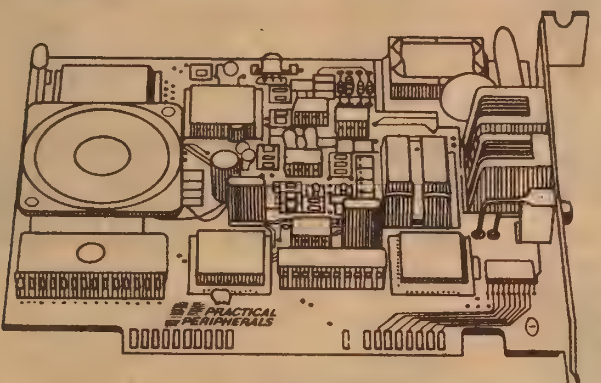

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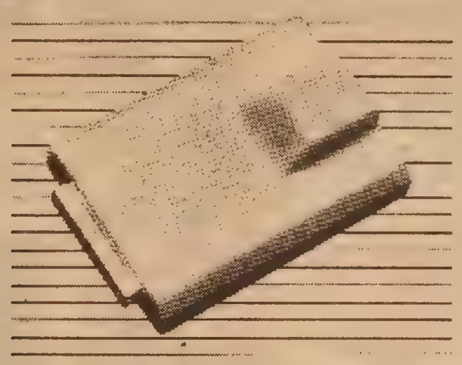

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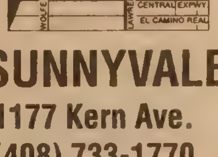

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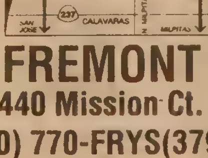

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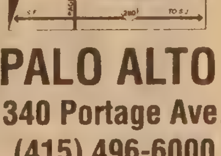

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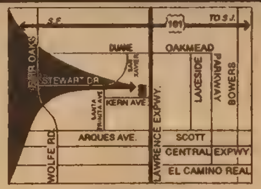

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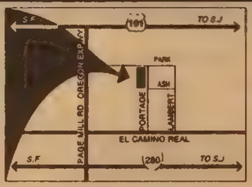

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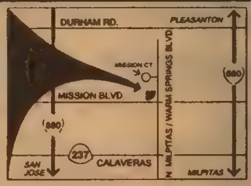

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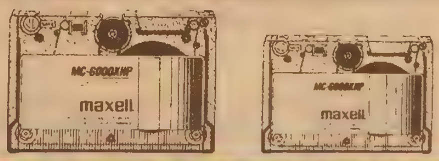

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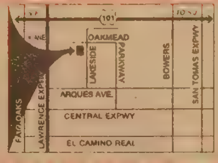

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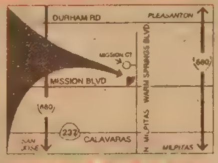

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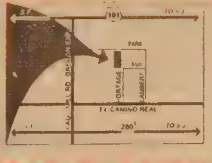

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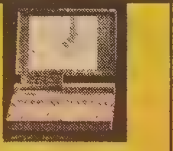

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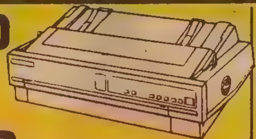

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136 Column • 11 Fonts
2 Scalable Fonts • 252 CPS Draft Mode
84 CPS NLQ Mode #1620186

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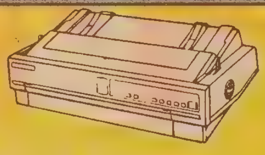

LQ1170 24 PIN PRINTER

136 Column•275 CPS Draft Mode
92 Letter Quality Mode

$629

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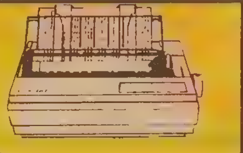

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24 PIN PRINTER

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275 CPS Draft Mode
92 Letter Quality Mode
#1612015

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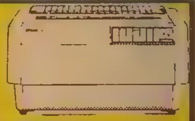

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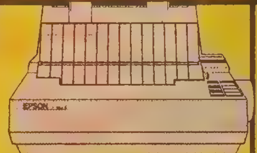

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80 COLUMN DOT MATRIX

80 Column • 264 CPS Draft 54 CPS NLQ
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SmartPark Feature
Tractor Feed
Two Year Warranty

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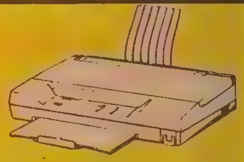

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ESC/P2 Control Language
Simple Control Panel
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Model
AP-3250
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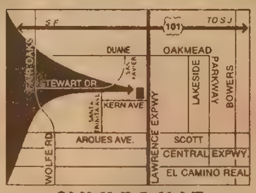

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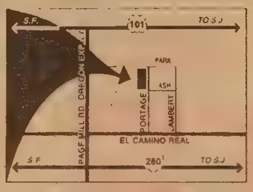

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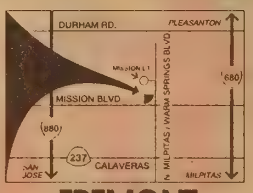

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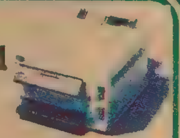

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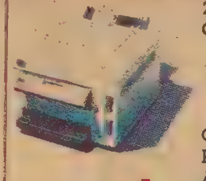

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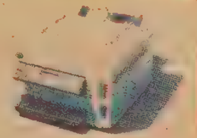

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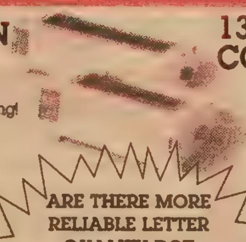

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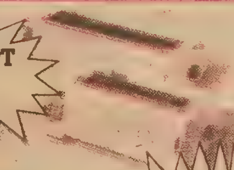

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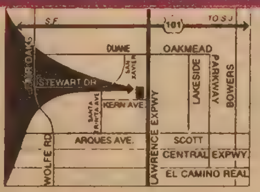

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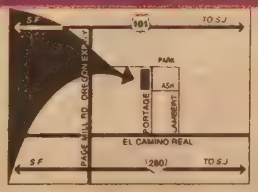

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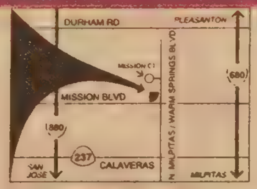

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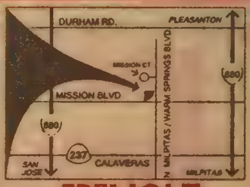

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192 CPS - 38 CPS NLQ
6 Built In NLQ Fonts
240x 216 DPI Resolution
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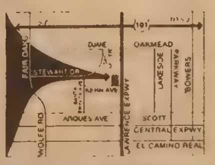

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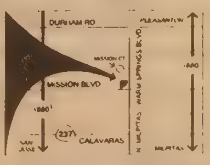

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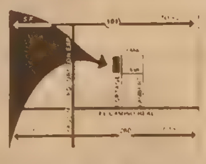

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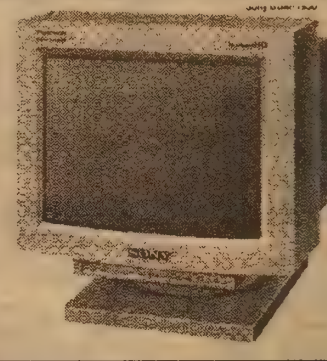

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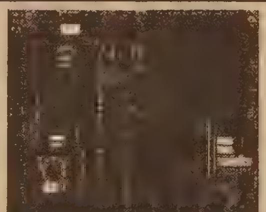

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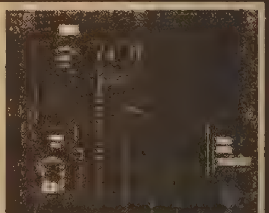

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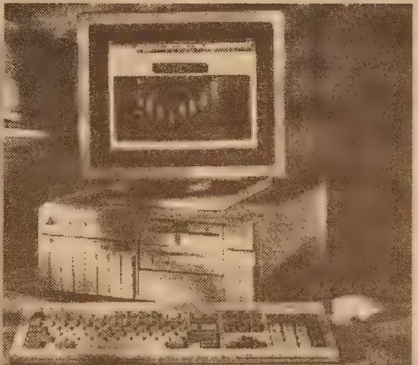

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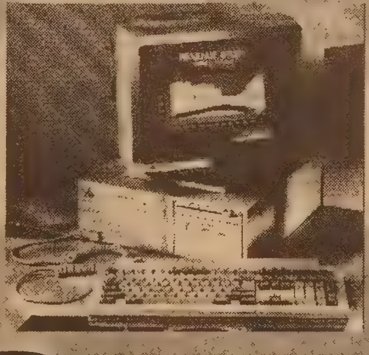

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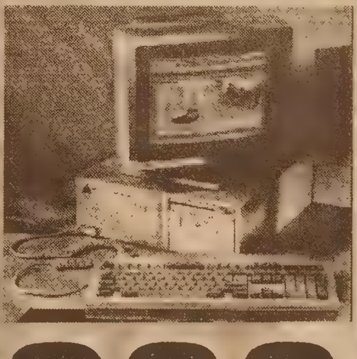

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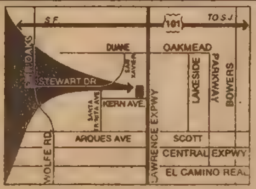

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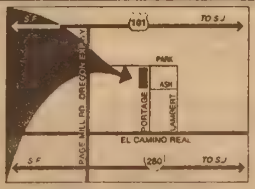

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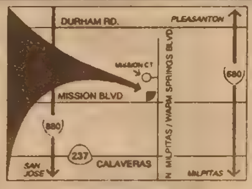

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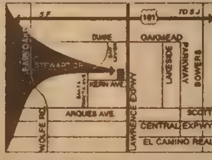

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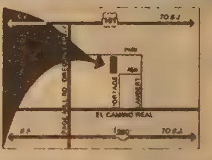

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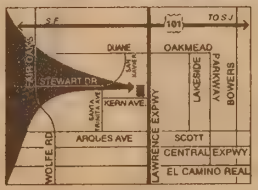

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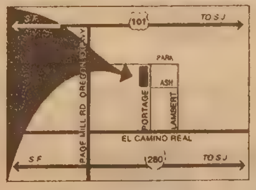

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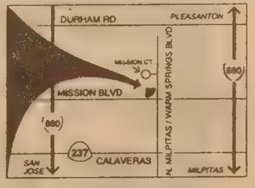

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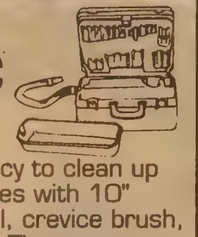

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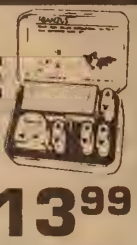

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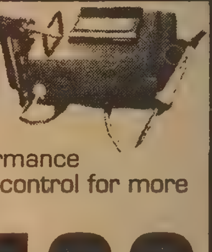

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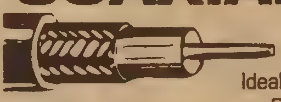

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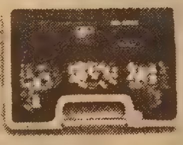

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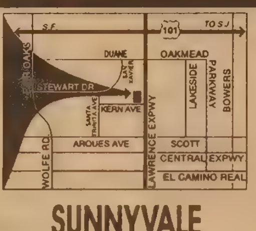

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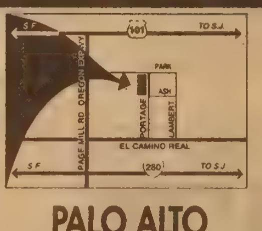

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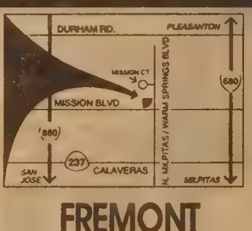

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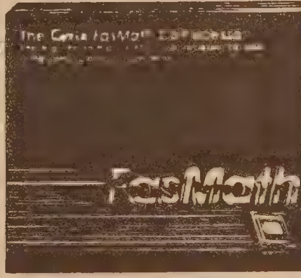

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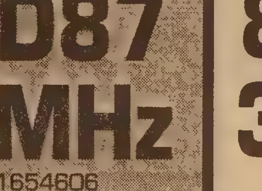

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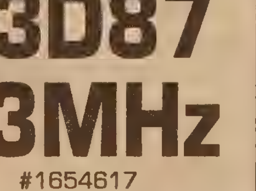

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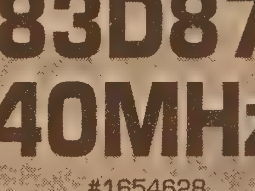

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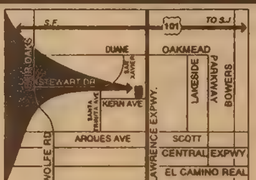

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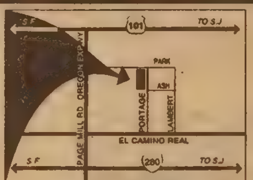

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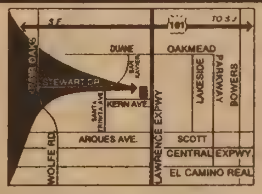

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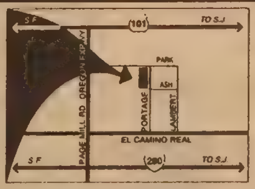

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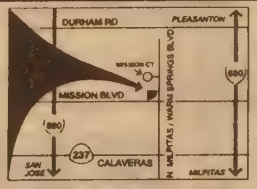

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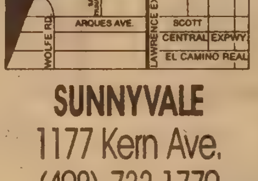

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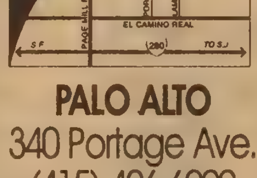

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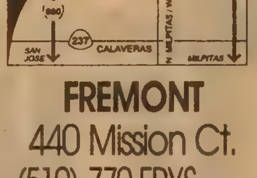

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Scanners: Do You Need One?

BY MIKE MARKOWITZ

Just as a modem is a computer's telephone, a scanner is a computer's camera. But why would anyone need to take pictures with a computer?

There are three basic reasons. You might need to get a picture into the computer in order to print it on paper as part of a newsletter, brochure, or other document, or you might need to use the picture on-screen in a program or computer-based presentation of some kind. The third major application is optical character recognition (OCR), which captures text without making you type it.

The choice of a scanner depends very much on what you need to do with pictures, and this, in turn, depends very much on the software you will use to get your final product. Your scanner must also be compatible with your computer, so you need to know what kind of interface connects the scanner to the computer, and how much computer memory is required by the scanner's software.

Scanners are usually sold with software, including the "device driver" that lets the scanner talk to the computer, and some kind of scanning application that lets you capture and save pictures.

For most users, the choice lies between hand-held scanners in the $200–$300 price range, and flatbed scanners ranging from $1000 to $2000 or so, with prices falling rapidly. Color scanners are increasingly affordable, but the high cost (or low fidelity) of color printing is still a major obstacle for home and small-business users.

HOW A SCANNER WORKS

Most scanners use a lamp to illuminate your original document, and an array of detectors (photodiodes or charge-coupled devices) to measure the light reflected from each point. The more tiny, tightly packed detector elements, the greater the resolution of the scanner. Originally, 300 dots per inch (dpi) was the upper limit, but lately even low-priced scanners are promising 400 or even 600dpi.

An odd fact, which you rarely see documented, is that a scanner is "blind" to the color of its own lamp. Most hand-held scanners use a red lamp, while many flatbed scanners have a bright green lamp. If you were in a room illuminated by red light bulbs, you probably couldn't tell the difference between a red sheet of paper and a white sheet of paper, since both sheets strongly reflect red light. Color scanners overcome this problem by using three lamps (red, green, and blue), or one white lamp, with three arrays of detectors, sensitive to the red, green, or blue components of the reflected light.

> **Imagine a high-quality print of a black-and-white photograph of a beautiful face—there are subtle shadings that define the contours and features. If you scan this as line art, you're going to get something ugly, because the software must assign every point to be either black or white.**

The signal from the detector array passes through analog-to-digital converter circuitry, becoming information that the scanner's device driver software can process. The scanner application software can then display, manipulate, and save the resulting image, based on the commands given by you, the user.

ENTRY LEVEL—THE HAND-HELD SCANNER

Hand scanners can typically capture an image 4" wide. Length is limited mainly by your computer's memory, but would usually be less than 11". Since you must roll the scanning head across the original graphic, careful alignment and a steady hand are vital. The latest software for hand scanners makes it possible to scan a large picture in several strips and then "stitch" the strips together smoothly into a single continuous image with no overlaps.

Most of these scanners use the same Japanese-made mechanism and electronics; the differences are mainly a matter of price and the features of the software included in the package. Top brands include Logitech, Thunderscan, and Marstek. Prices range from as little as $129 to over $500 (for a color hand scanner).

HEAVY DUTY—THE FLATBED SCANNER

The flatbed scanner looks like a small photocopy machine, and uses some of the same technology. The scanner can usually handle anything up to 8.5" x 14", assuming the driver

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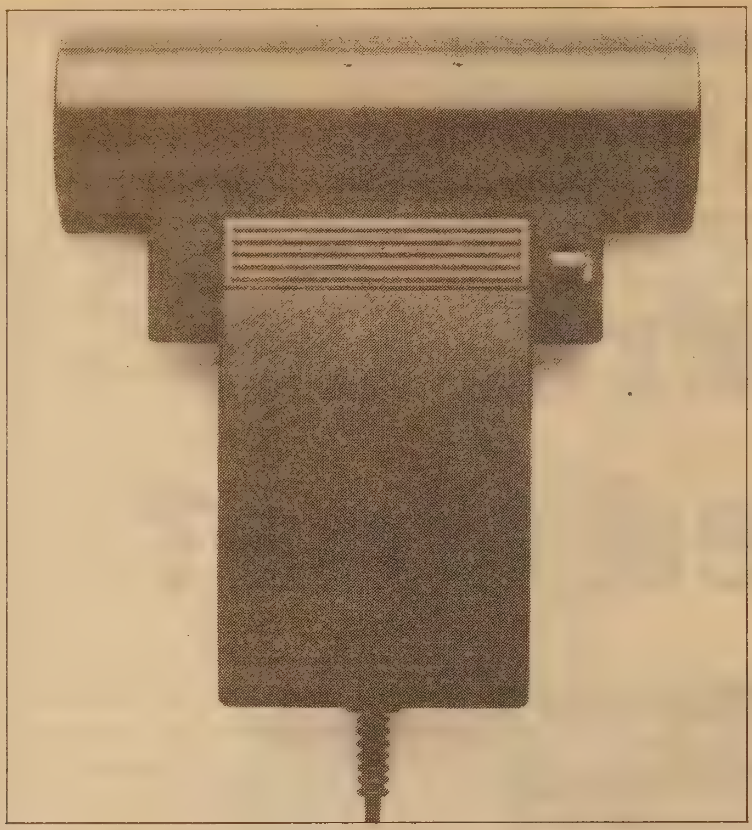
You can send email to Mike Markowitz on America Online (MOUSKOWITZ) or the Internet (mmarkowi-@pepvax.pepperdine.edu). Or fax (310)983-1474.



software supports this size and the amount of memory in your computer is sufficient.

Scanners for the Macintosh usually have an interface (built-in or in a separate box) that plugs into the computer's SCSI port. PC scanners may have their own interface card that requires a slot inside the computer, or they may simply use the built-in parallel port.

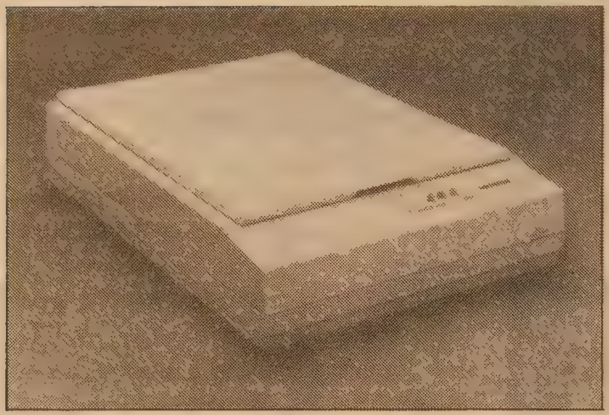
The Caere Typist is an example of a hand held scanner.

In any case, the user must find a way for the computer to control the scanner, and feed the scanned information back to the computer for storage and manipulation.

SCANNING YOUR STUFF

One of the first things a scanner user must decide upon is whether a particular original image is even worthy of being scanned. In scanning as in life, the First Law of Data applies: Garbage In, Garbage Out. It goes without saying that the better the master, the better the scanned output will be.

Sometimes this will be easy, as in the case of text that is being scanned. Most good OCR scanner software (such as OmniPage by Caere) has the ability to "tighten up" text on even the worst photocopies. Graphics scanning is another thing entirely though. This determination should be based on a number of factors. Some of these might be:



A flatbed scanner by Microtek.

- Whether you are planning to use the material to do overlay drawing, or as a finished graphic in a document.
- What kind of final form output the material will take. Laser printers rated at 300dpi do not require the same quality of original material that you would need for a publication-quality image setter, such as a Linotronic at 1200dpi.
- How much time you are willing to invest with the scanned material to improve and manipulate it after it is scanned.

ABOUT GRAYSCALES

One important variable is contrast. In a high-contrast image you have dark blacks and bright whites; in a low-contrast image there is a narrow range of fuzzy grays. Remember that inside a computer everything must ultimately boil down to a binary decision: it's gotta be a zero or a one.

If your original artwork contains only black lines on white paper, most scanners provide a setting or option (often called "line art") that gives the best results.

But what if your original artwork is a photograph, with a continuous range of shades of gray? Imagine a high-quality print of a black-and-white photograph of a beautiful face—there are subtle shadings that define the contours and features. If you scan this as line art, you're going to get something ugly, because the software must assign every point to be either black or white.

One way that the programmers and engineers who design scanners deal with this problem is called "dithering." In darker areas, we lay down a denser pattern of black dots. In lighter areas we lay down fewer black dots. The HyperScan software that came with the original Apple Scanner did this in a particularly elegant and effective way.

More sophisticated and powerful scanners can assign more than one bit of data to each pixel of the image. This allows the continuous range of shades between black and white to be divided up into a "grayscale." For example, if we have four data bits per pixel, we can work with sixteen shades of gray. Six bits per pixel give us sixty-four shades of gray and eight bits per pixel give us 256 shades of gray, which is getting close to what the human eye can distinguish (call it "near-photographic" quality). A good color monitor can display all these shades of gray very nicely, but a printer only has one color of ink—or toner—to lay down on the paper. So how can we output our beautiful grayscale image?

Early in this century, when printers (the people, not the machines) first faced the problem of mass-reproducing photographic images, the solution they developed was to shoot the original image through a fine "screen" (of lines etched on a glass plate). In dark areas, the screen would break up the image into big dots. In light areas the screen would break up the image into small dots. When you look at a newspaper photograph through a strong magnifying lens, you can actually make out the different-sized dots.

Now, unlike the lithographic plates used on a newspaper press, a laser printer can't really make different-sized dots—it can only make one size of dot. But through the wonders of software, there are ways to fake a halftone-like image. This can fool the human eye into constructing an image inside the brain that is more "realistic." Hewlett-Packard calls this Resolution Enhancement; Apple calls it PhotoGrade and FinePrint. However they do it, and whatever they call it, the net result is to enable a smoother transition across the chasm between the scanned image and the printed page.

ABOUT OCR

The keyboard is the greatest single barrier between people and computers. The combination of a scanner and optical character recognition (OCR) software can help to break down part of that barrier, by making it possible to input great amounts of text quickly and accurately without typing. OCR is based on decades of research into automated pattern recognition. OCR software takes a scanned page image, and very rapidly and systematically makes a series of "guesses" about which character is represented by each blob of dark and light spots.

Early OCR systems required the use of special typefaces that were designed to increase the probability that the system would make the right guess. Some OCR software requires "training" to recognize each typeface you give it. The most advanced and easy-to-use OCR products employ powerful generalized pattern-recognition algorithms that can distinguish, let's say, a "B" from an "8" in almost any style or font. The final product is a text file, ready for spell checking.

The law of Garbage In, Garbage Out is particularly applicable to OCR. If the original page is blurred or smudged, even the best software is likely to make a bad guess. For example if the crossbar of a capital letter "H" is too faint, then the software may interpret the pattern as "ll." If the program cannot make anything out of a particular blob, it will insert a special character (OmniPage uses the tilde) to let you know it failed. A spell checker should always be used on OCR output, to catch the obvious errors.■

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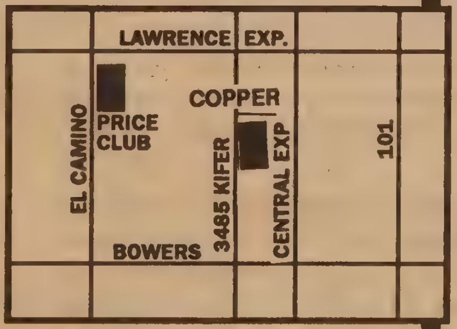

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Moving Up To Multimedia

Media Vision's Multimedia Upgrade Kit Is A Complete Package Of Hardware And Software That Turns Your Desktop PC Into A High-Powered Multimedia PC

BY WOODY LISWOOD

> *"Windows with Multimedia blends publishing, entertainment, and computers into a medium for information exchange that expands the potential of all three areas."*
>
> —excerpt from documentation for Media Vision's Windows Multimedia Kit

After a long delay, I recently installed the Windows Multimedia Upgrade Kit from Media Vision. This kit offers many capabilities, including letting me play audio CDs in the CD-ROM drive, while also using the computer for an array of multimedia functions.

One of the first things I did was put a Whitney Houston audio disc in the CD-ROM drive, called up the Music Box program, and began listening to Houston's voice over my speakers. After getting that started, I launched my telecommunications program, Crosstalk for Windows, and had it connect me with The WELL, the Sausalito-based electronic conferencing system, and checked the Computer Press Association SIG to see if there was any new information I needed to know. Without quitting either the music or telecommunications, I switched into AmiPro to print a document I downloaded the day before. Two clicks of the mouse brought me back to The WELL to continue exploring this electronic universe.

In the middle of doing this, I was struck by the fact that I was having fun, and it felt like those very early days when I had my first microcomputer—an Apple II. Here I was, listening to music, printing, and communicating, using four different cards in my computer simultaneously, doing three things at the same time, and everything was working smoothly.

WHAT IS MULTIMEDIA?

Is this what Multimedia is all about? Darned if I know.

One definition I've heard some people use defined multimedia as the use of all the media (senses) available when developing applications and/or output from your computer. When we talk multimedia, then, we are discussing the integration of sound and vision to the typical microcomputer production of screen visuals and printed output.

So, now we can add sound to our output. Does that mean that we can now have a voice read the words on our slide? Yes it does. Just like in the movies, when you say you want to slam the door on your competition, you can show the door on the screen, and hear it slam in the background. But, you say, you want to show the door slamming as well. Well, that is full motion video and, yes, you may be able to do that as well, but it is not yet part of the multimedia upgrade kit from Media Vision.

HARDWARE FOR MULTIMEDIA

To support all these different things going on, with many of them happening simultaneously, you need an array of hardware and software goodies all working together with your computer.

It is usually recommended that the multimedia PC have the following minimum characteristics: 80286, 10MHz, 2MB RAM, VGA with 15 or 256 colors, 30MB hard drive, CD-ROM drive with digital audio output, two-button mouse, and sound board that supports music and voice.

I've tried to run multimedia on this minimum configuration and find it sadly lacking. My advice is at least a 25MHz 386, 8MB RAM, VGA with 256 colors, 120MB hard drive, high-speed CD-ROM drive with digital audio output, mouse or trackball, and a sound board.

The critical change here is the 80386. There is so much happening at once, via multitasking, that you need a processor which can keep everything moving. A 10MHz box just doesn't cut it. And running multimedia with less than 8MB RAM just does not make sense.

You *must* have the 256-color display card and drivers—many applications are now designed specifically for that environment. You also need a 120MB hard drive to load Windows, your regular productivity applications, and multimedia applications, unless the only thing you are going to do is run multimedia applications.

MULTIMEDIA UPGRADE KIT

The Media Vision Multimedia Upgrade Kit includes an assortment of hardware that must be installed for everything to work. You get a Pro Audio Spectrum stereo sound board, Sony CD-ROM drive (internal or external), cables to attach everything, Windows Multimedia, Compton's Multimedia Encyclopedia CD-ROM, Jones in the Fast Lane CD-ROM, and Leisure Suit Larry software in 256-color graphics and sound. The Pro Audio Spectrum sound board contains a SCSI port which also controls the Sony CD-ROM.

Windows Multimedia comes on a CD-ROM. The extensions are really an additional set of programs and device drivers that Windows needs to understand and run things like audio and visual applications. There is minimal documentation with this Windows Multimedia upgrade. Instead, there is a hyperguide application on the CD-ROM disc where you are supposed to look for answers to your questions. I found it marginally helpful and that trial and error works best when trying to understand the extensions. The problem is that you will have questions about the multimedia extensions when you are running other multimedia CD-ROM applications and you will not have the Windows Multimedia CD-ROM disc in the drive.

In addition to adding multimedia capabilities, this upgrade also adds some accessories. One of these accessories, the Music Box, lets you play audio CDs in the CD-ROM drive. Using the mouse, the drive will do anything a normal CD player lets you do.

Another accessory is the Media Player. In addition to playing audio CDs, this program can play sound (or WAV) files, MIDI sequencer files, and videodisc players as well.

The Sound Recorder accessory allows you to play, record, or edit WAV files. It also lets you mix two WAV files together as well as

RESOURCES:

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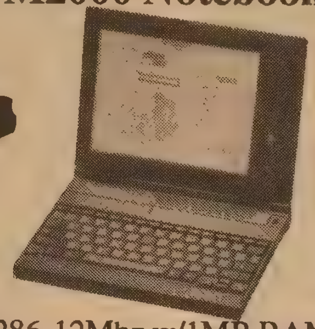

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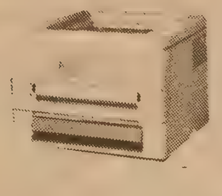

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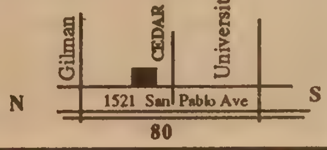

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other sound manipulations, such as changing the volume, increasing or decreasing the speed at which the file plays, adding echoes, and it even lets you play a file in reverse.

The Pro Audio sound board must be connected to either your stereo system or a pair of amplified stereo speakers. I picked up a pair of Labtec 22-100 speakers for around $20. I think that the speakers should also be part of the upgrade kit, since you really need them to hear stereo sound and you may not have your normal stereo amplifier nearby.

The Pro Audio Spectrum sound board also includes a group of additional goodies associated. It has a SCSI 50-pin male connector, a 4-pin male connector for connecting to the internal speaker that came with your microcomputer, an internal audio pin connector for directly connecting to an internal CD-ROM unit, stereo line in and out, a microphone in, and a MIDI-joystick connector. In addition to providing high-quality stereo sound, it is AD-LIB compatible, and can be used with games that contain AD-LIB support.

AudioMate software, from Pro Audio, works with Freelance, Harvard Graphics, and Autodesk Animator, and lets you play audio CD tracks, MIDI files, or WAV sound files, To help, a variety of sound files accompany AudioMate. When you create your control file, you name your sound files the same name you used to create the graphic display files. AudioMate sits in the background and when you display a new slide, AudioMate pays the associated sound file.

The external CD-ROM drive was a Sony CDU-6211. It uses a half-height drive, has (as do most CD-ROM units) two SCSI 50-pin female connectors which conform to the ANSI X3.131-1986 standard, and allows up to eight SCSI devices to be daisy chained together. There are stereo audio output jacks at the back and a stereo headphone mini-plug jack on the front. The unit works with CD-ROM Mode 1 and Mode 2 data discs as well as audio CD discs and discs that combine digital and audio data.

When you load MSCDEX.EXE, the MS-DOS CD-ROM extension that allows DOS to find and run your CD-ROM drive, you must specify what drive letter you want for the CD-ROM drive. The version of MSCDEX I was using, v2.2, worked equally well with MS-DOS 5.0, and DR DOS 5.0 and 6.0.

MULTIMEDIA CD-ROMS

There are three CD-ROMs included as part of the upgrade kit.

Multimedia Windows is on a CD-ROM. In addition to the Windows upgrade and the multimedia extensions (discussed earlier), this disc includes some demonstration WAV and MIDI files as well as some advertising for other CD-ROM products.

Jones in the Fast Lane is a CD-ROM game designed to be played by up to four people. It is like SimCity for people. You start the game with nothing, and must work your person into being in control of everything. We (my family and I) tried it for a couple of hours and found it amusing. I still find it difficult to play a computer game with four people, when everyone must run their own person. You spend too much time sitting around, but fun nevertheless.

The Compton's MultiMedia Encyclopedia CD-ROM begins to give you a sense of what MultiMedia is all about. In addition to the typical encyclopedia type of entries, there are color visuals and sound tracks. Compton's is easy to get around in and has a nice random display feature, which you can turn on, watch the screen images shift and change, and stop when something interests you. The color visuals require a 256-color driver for Windows. I tried the normal drivers and the pictures display as blobish gray. Things brighten up considerably when the 256-color driver is used.

Completing this set is a 256-color Leisure Suit Larry software package. While it is a DOS, rather than a Windows program, and runs from a mouse, it is the original Larry, not a new version. I liked it, but it did take some getting used to, since you had to point with the mouse pointer, and select actions from a set of icons rather than type in the actions at the keyboard. After a few minutes, though, I did get the hang of it, and ran Larry through the first few screens. Yes, everything I remembered was there.

GETTING STARTED IN MULTIMEDIA

The Media Vision MultiMedia Upgrade Kit is a dynamite way to get started in multimedia. It contains a high-quality Sony CD-ROM drive, a great Pro Audio Spectrum sound board, a couple of good CD-ROM applications to work with, and enough challenges to make use of all this equipment. Nice job, MediaVision. Next time, add the speakers, though! ■

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Windows 3.0 + Super Mouse II (400dpi)		68
Internal Modem 2400 Baud		44
Fax Modem (9600 Fax,2400 Modem)		72
3-Button Mouse		15
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Logitech Mouseman Bus (400dpi)		65
Colorado Tape Backup DJ-10/20	190	260
Baby AT/Mini Tower Case w/200W PS		59
Medium Tower Case w/200W PS		99
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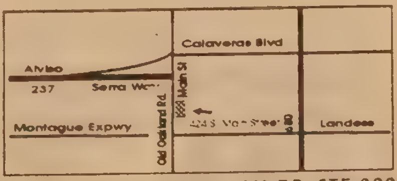

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486-EISA 50MHz
Mylex 4MB EISA SCSI CONTROLLER, $4789
256K Cache 4MB RAM, 645MB hard drive

☐ *Intel* 80486DX-50MHz CPU,
☐ 8K internal Cache, 0 wait state
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☐ 256K fast SRAM Cache
☐ 4MB RAM, Maximum 64MB
☐ *AMI* BIOS, *Intel* 82350 EISA chipset
☐ Eight 32bit EISA slots
☐ *Maxtor* 645MB SCSI drive
☐ *Mylex* DCE376 EISA Cache 32bit SCSI controller w/1MB RAM (Maximum 16MB), Data transfer rate 26MB/sec
☐ 275 Watt power supply with two cooling fan
☐ Full tower case with 7 drives bay
☐ *Teac* One 5 1/4" 1.2MB floppy drive
☐ *Teac* One 3 1/2" 1.44MB floppy drive
☐ Two serial, One parallel & Game port
☐ *Diamond Stealth*VGA card w/1024K 1280x1024, Hi-color, Non-interlaced
☐ *NEC* 4FG 15" multisync monitor, Falt Screen, NI
☐ *Focus* 2001 enhanced keyboard
☐ Landmark 197MHz (V1.14)
☐ Power meter 19.9 mips (V1.5)

486-EISA 33MHz
Ultrastor 15C Cache controller
Maxtor 210MB hard drive

256K cache RAM, AMI BIOS, 8 EISA slots, 1 MB RAM, *Ultrastor* 15C Cache controller W/ 1MB (8MB maximum), Duel floppy drive, TVGA card w/1024K, *Viewsonic* V6 14" non-interlaced monitor, One parallel, two serial ports, 275 Watts power supply with two cooling fan, Full tower case with 7 drive bay, Focus 2001 enhanced keyboard, Optional: additional memory per megabyte $45, **$2695**

486-50MHz
256K Cache $1195
1MB RAM

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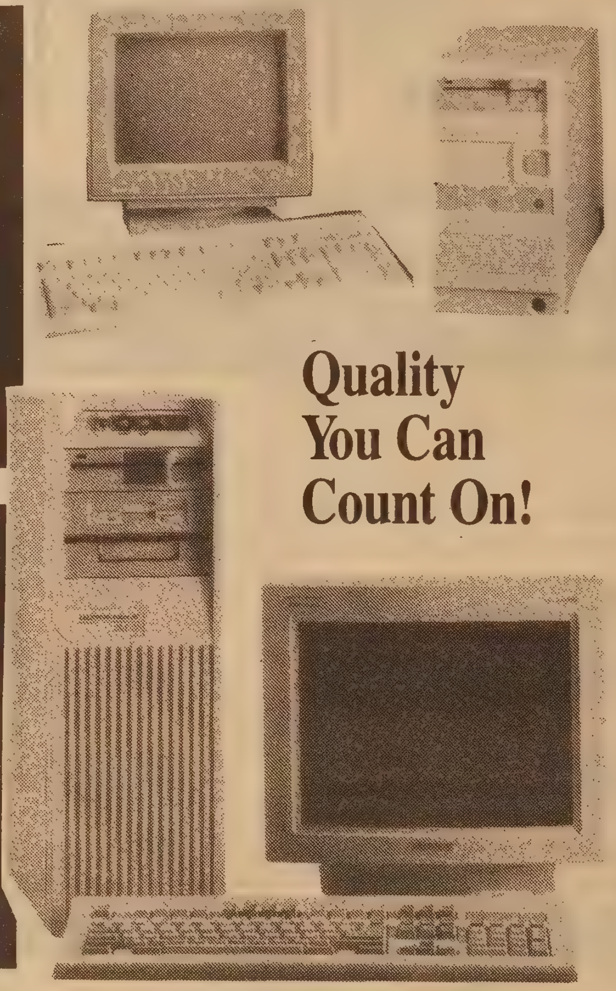
☐ 8K internal Cache
☐ 256K fast SRAMCache on board
☐ 1MB RAM on board, 32MB Maximum
☐ *Teac* 1.2MB or 1.44MB floppy drive
☐ Two serial, one parallel, game port
☐ *Focus* 2001enhanced 101-key keyboard
Conner 210MB hard drive, *Viewsonic* V6 Non-interlaced SuperVGA system **$2149**



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64K Cache $777
1MB RAM

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☐ 64K fast SRAMCache
☐ 1MB RAM on board, 64MB Maximum
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☐ Two serial, one parallel, game port
☐ *Focus* 2001enhaced keyboard
Conner 210MB hard drive, *Viewsonic* V6 Non-interlaced SuperVGA system **$1697**
Conner 210MB hard drive, 14" Hi-res. Mono System **$1277**

386-33MHz
64K Cache $449
1MB RAM

☐ *Intel* 80386DX-33MHz CPU
☐ *AMI* BIOS, Co-Processor socket build-in
☐ 64K fast SRAMCache on board
☐ 1MB RAM on board, 32MB Maximum
☐ *Teac* 1.2MB or 1.44MB floppy drive
☐ Two serial, one parallel,One game port
☐ *Focus* 2001enhanced keyboard
Conner 210MB hard drive, SuperVGA System **$1377**
Conner 120MB hard drive, 14" Mono System **$ 899**

386SX-25MHz
1MB RAM $349

☐ *Intel* 80386SX-25MHz CPU
☐ *AMI* BIOS, Co-Processor socket build-in
☐ 1MB RAM on board, 8MB Maximum
☐ *Teac* 1.2MB or 1.44MB floppy drive
☐ Two serial, one parallel,One game port
☐ *Focus* 2001enhanced keyboard
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SpeedStar	1MB , 1024x768, Non-interlaced	169

MONITORS

ViewSonic

V4E	14"	1024x768 .28	319
V6	14"	1024x768 .28 Non-interlaced	359
V7	17"	1280x1024 Non-interlaced	1099
V8	20"	1280x1024 .31	1699

NEC

3FGX/ 4FG/ 5FG	669/819/1399
6FG 21" 1280x1024 .28mm 135MHz bandwidth	2999

Sony

1304S	14"	1024x768 .25 Non-intlaced Low radiation	559
1604S	17"	1024x768 .25 30-57 KHz scan frequency	1075
1936	20"	1280x1024 .30 Non-int. low radiation	2499

Panasonic

C1381i	14"	1024x768 .28 IBM/MAC 800x600 Non-int.	329
C1395	14"	1024x768 .28 Non-interlaced	469

DRIVES

Teac (Floppy drive)

360 K / 1.2MB	5.25"	$ 59
1.44MB	3.5"	59

Maxtor

LXT-213	SCSI	213 MB	15 ms	569
LXT-340	SCSI	340 MB	15 ms	899
4170E	ESDI	158 MB	16 ms	729
4170S	SCSI	158 MB	16 ms	729
8380S	SCSI	360 MB	14 ms	1089
8760S	SCSI	650 MB	14 ms	1199
7080A	IDE	80 MB	19 ms	269
7120A	IDE	125 MB	15 ms	329

Conner (IDE Hard drive)

3000	IDE	40 MB	28 ms	195
3084	IDE	80 MB	19 ms	269
30104	IDE	120 MB	19 ms	329
3204	IDE	212 MB	19 ms	549
3504	IDE	510 MB	12 ms	999
30174	IDE	170 MB	17 ms	399
3544	IDE	543 MB	12 ms	1199

Colorado (Tape back-up drive)

QFA -700	700MB, 12MB/min., Novell,LANtastic compatible			749
Jumbo	DJ-10	120 MB	Internal	199
Jumbo	DJ-20	250 MB	Internal	289
AB-11	External Adaptor			45
KE-9	External kit (w/o Controller)			79

Everex

Tape drive	60/120MB Internal	229
Tape drive	120/240MB Internal	269
EV-880	Tape adaptor	69

CD-ROM drive

Sony	Laser library 640MB External	499

PRINTERS

Panasonic

KX-P1123	24 pin	214 cps	80 col	199
KX-P1124i	24 pin	240 cps	80 col	289
KX-P2123	24 pin	240 cps	80 col quiet	249
KX-P2180	9 pin	192 cps	80 col quiet	199
KX-P1524	24 pin	240cps	132 col	329
KX-P1695	24 pin	330cps	132 col	349
KX-P2624	24 pin	300 cps	136col	379
KX-P4410	Laser	5 ppm	512K	645
KX-P4450i	Laser	11 ppm	512K	1099
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DeskJet	500 / 500C	389/695
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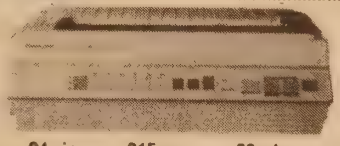

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LQ-570	24 pin	315 cps	80col	269
LQ-870	24 pin	413 cps	136 co	459
LQ-1070	24 pin	315 cps	136col	359
LQ-1170	24 pin	413 cps	136col	599
LQ-2550	24 pin	400 cps	136col	899
FX-850	9 pin	264 cps	80col	309
FX-1050	9 pin	264 cps	132col	419
EPL-7000	Laser	6 PPM	512k	819
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EPL-8000	Laser	10PPM	13 Scalable fonts	1379

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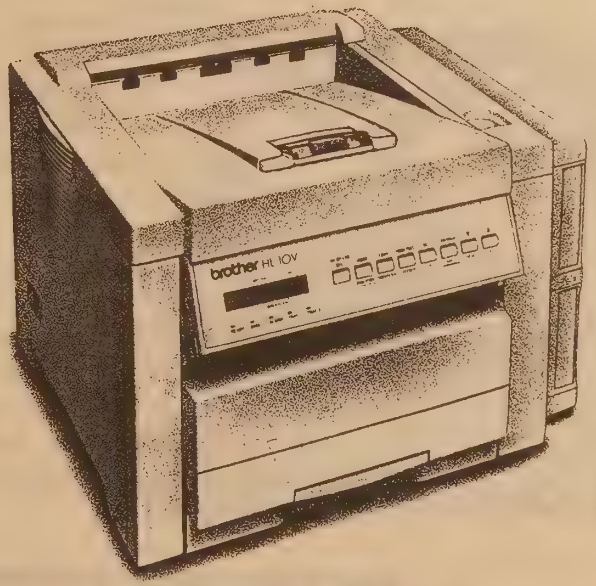
- Auto interface switching



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	Brother HL-10V	HP LaserJet III
Pages per minute	10	8
Scalable fonts	12	8
Bitmapped fonts	24	14
Universal Tray	YES	NO
Gray Scales	64	8
Auto-Interface Switching	Standard	NO
Auto-Emulation Switching	Standard	NO

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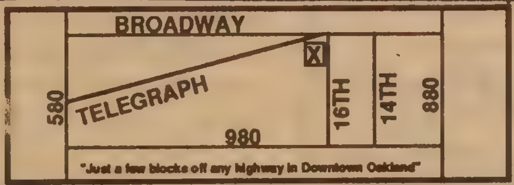

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PRODUCT SPOTLIGHT

New Products

ACCESSORIES

POWERBOOK TRAVEL CASE

The new Travel Case, for the Macintosh PowerBook, offers an open front design that allows easy use of the PowerBook without removing it from the case, and an open back design that permits access to cable connections. It is made of durable, water repellent Dupont Nylon Cordura and features an adjustable, padded shoulder strap; a locking zipper with keys; inside pockets; and an accessory pouch for a power supply, external drive, or battery. ($79.95. It is also bundled with Pastel's personal organizer software, DayMaker, for $149.95) Pastel Development Corp., 113 Spring St., New York, NY 10012. (212)941-7500.

WRISTSAVER

The Wristsaver, a wrist support device, helps to reduce occupational illnesses and hazards such as repetitive motion injury and carpal tunnel syndrome. Ergonomically designed to provide the proper positioning for wrists and hands when working at the computer keyboard. Made of durable ABS plastic contoured for maximum comfort, the Wristsaver is covered with non-skid soft neoprene foam rubber that will not scratch the work surface. The fabric can be cleaned with warm water and mild soap. ($18.95, Wristsaver Mousepad also available for $18.95) GBM Design, Inc., 3732 W. Century, Suite 2, Inglewood, CA 90303-1100. (213)677-8801.

NETWORK SOFTWARE

SYBASE SQL SERVER FOR NETWARE

Sybase introduced Sybase SQL Server Release 4.2, a NetWare Loadable Module for Novell's NetWare 3.11. This high-performance, client/server-based relational database management system for online, enterprise-wide applications features a multi-threaded and programmable server architecture that delivers scalable

Continued

PRODUCT UPDATES

➤**Autodesk Multimedia Division** announced **Autodesk 3D Studio Release 2**, a major upgrade providing new visualization tools and productivity enhancements for graphics professionals using 386/486-based PCs. Autodesk, Inc., 2320 Marinship Way, Sausalito, CA 94965. (415)332-2344.

➤**D-Link** introduced **LANsmart v3.2**, which provides a full peer-to-peer resource-sharing solution for both DOS and Novell NetWare. D-Link Systems, Inc., 5 Musick, Irvine, CA 92718. (714)455-1688.

➤**Fifth Generation** announced **SuperLaserSpool 3.0**. Upgrades are available to registered users for $30. Fifth Generation Systems, Inc., 10049 N. Reiger Rd., Baton Rouge, LA 70809. (504)297-7221.

➤**Gizmo Technologies** announced **ShadowWriter 2.0**, a major upgrade to its software that allows standalone personal printers to be shared by all the Macintosh computers on a network. Current users can upgrade for $20. Gizmo Technologies, Inc., PO Box 14177, Fremont, CA 94539. (510)623-7899.

➤**M-USA** announced **Pacioli 2000 v2.0**. For a limited time owners of competing accounting, spreadsheet, tax preparation, checkwriter, or personal finance programs can purchase Pacioli 2000 v2.0 for $29.92. M-USA Business Systems, Inc., 15806 Midway Rd., Dallas, TX 75244. 1-800-933-6872.

➤**NewGen Systems** announced the availability of **Windows 3.1 drivers** for its entire line of high-performance laser printers. NewGen Systems, Inc., 17580 Newhope St., Fountain Valley, CA 92708. (714)641-8600.

➤**Polaris Software** announced the **Act-to-PackRat conversion utility** and a $145 **competitive upgrade price**. The utility translates a file from Contact Software's Act contact management program into a file for Polaris PackRat. The competitive upgrade price is available to users of other PIMs and contact managers such as Act. Polaris Software, Inc., 17150 Via Del Campo, Suite 307, San Diego, CA 92127. (619)674-6500.

➤**Revelar Software** released **ConstructionMac 1.2**, a standalone application for estimating residential remodeling and construction. Revelar Software, Inc., 772 E. 3300 S., Suite 210, Salt Lake City, UT 84106. (801)485-3291.

➤Users of **T/Maker's WriteNow** can upgrade to **v3.0** for only $49.95 through June 30, 1992. After that date the upgrade will increase to $69.95. In addition, when you upgrade, you can purchase an additional copy of WriteNow for your personal use at home or work for only $69.95. T/Maker Co., 1390 Villa St., Mountain View, CA 94041. 1-800-688-2850.

➤**Z-Nix** and **Novell** are bundling **DR DOS 6.0** with the **Z-Nix Cordless Super Mouse** and **Super Mouse II products**. Z-Nix will also package and sell the DR DOS 6.0/Super Mouse II bundle with **Windows 3.1** as a **Valu Pac**. Z-Nix Company, Inc., 211 Erie St., Pomona, CA 91768. (714)629-8050

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- ☑ Scheduled Broadcast : Send multiple pages to multiple destinations
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You Get more than a fax machine. The stand alone **HP compatible Page Scanner** let you do :

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System Requirements :

- ☑ IBM PC/XT/286/386/486 or compatibles
- ☑ HP, Epson, or other printers connected to the system

Optional Package :

With Ripe R9624FM modemfax card	**$ 419**
W/ OCR Package : Wordscan (Windows) or Recognita (DOS)	**$ 499**

- We accept Visa/Mastercard or COD cashier's check
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ScanPlus PageReader B & W Page Scanner,
Ripe R9600F 9600 baud send/receive fax card
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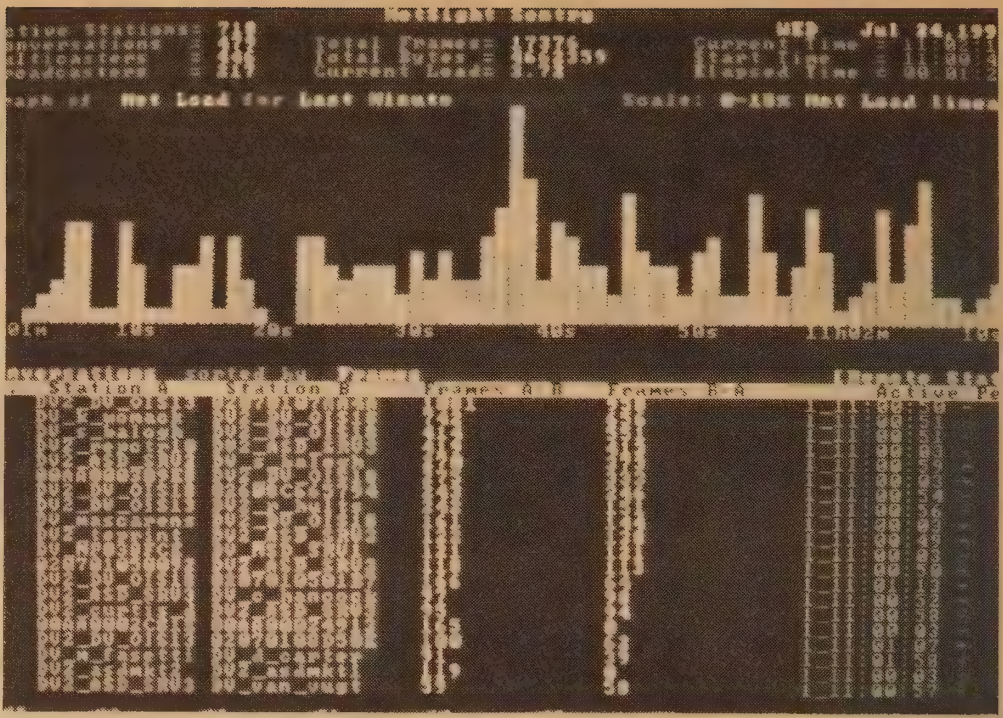
Santa Clara, CA 95054
TEL : 1- 800- 685 - 8088

high-performance and server-enforced integrity on a wide variety of platforms from NetWare- and OS/2-based computers to UNIX and VAX systems. Sybase SQL Server for NetWare also features open interoperability capabilities that allow the database server to communicate with other Sybase servers on other hardware platforms, as well as with other data sources and applications. (Single-user version, $1995; 2–8 users, $4995; 17–32 users, $15,995; and unlimited users, $29,995) Sybase, Inc., 6475 Christie Ave., Emeryville, CA 94608. (510)596-3500.



MOSESALL! PEER-TO-PEER

MosesAll!, plug-and-play, peer-to-peer network operating software, is easy to install and supports up to eight computers, sharing applications and data and printing files. MosesAll! supports operations for up to 150 feet per node using standard telephone wire for a total of 850 feet end-to-end. The system size can be increased up to 500 feet per node using standard unshielded twisted pair cable. It comes with a single 2MBPS network card, a copy of MosesNOS 3.0 network operating software, and one 25-foot length of standard telephone wire. ($99 per node) Moses Computers, Inc., 15466 Los Gatos Blvd., Suite 201, Los Gatos, CA 95032. (408)358-1550.

INTEL LANSIGHT SUPPORT 3.0

LANSight Support 3.0 software, a server-based troubleshooting tool, lets network administrators remotely monitor and control workstations connected to a LAN Manager or LAN Server network. Using LANSight Support 3.0, the LAN administrator can access user workstations from any DOS PC on the network, assuring prompt diagnosis of potential trouble spots. In addition to the workstation monitoring capabilities, LANSight provides convenient access to other network devices located at any addressable node. This lets the LAN administrator access file servers, print servers, mail gateways, and fax servers—all without leaving their desk. It also includes baseline security integrated at the server level, making it a comprehensive solution for network integrity. ($395) Intel Corp., 2200 Mission College Blvd., PO Box 58119, Santa Clara, CA 95052-8819.

FOLIO MAILBAG

MailBag, for Novell NetWare networks, is a PC software package designed exclusively to store, categorize, and instantly retrieve email messages. Messages received or sent by a user, as well as textual attachments to those messages, can be saved from the email program to a network user's personal, secure, infobase file. To save messages users simply tag or open the appropriate messages to be saved, then press a single keystroke. At this point, MailBag routes the message to the MailBag queue. The messages are held in the queue until the MailBag sends them onto the appropriate user's infobase. As messages are appended to the infobase, they are fully indexed to provide full-text retrieval of any word, phrase, number, or combination thereof; they are also compressed to conserve disk space. MailBag archives mail from most of the popular LAN-based email products, including Action Technologies The Coordinator, Da Vinci eMAIL, Lotus cc:Mail, Microsoft Mail, and WordPerfect Office. (25-user MailBag license is $295) Folio Corp., 2155 N. Freedom Blvd., Ste. 150, Provo, UT 84604. (801)375-3700.

IDR UNICOM VIA PC LAN SOFTWARE

Network users can easily send and receive fax, modem, and/or telex transmissions directly from their workstations when using Via PC LAN Software. This integrated LAN package provides a single, coherent user interface. Network features include the ability to share up to twenty modems, direct network shareable support for real-time fax functionality with the Hayes JT Fax 9600 and Intel SatisFAXtion fax boards, and convienent access to the most popular online services, including AT&T EasyLink, MCI Mail, CompuServe, Lexis/Nexis. Other features include improved color support, easier-to-use menus, and the ability to provide individual fax and modem dialing directories for each network workstation. ($1995, standalone version is $295) IDR UniCom, Inc., 400 Stenton Ave., Plymouth Meeting, PA 19462. 1-800-626-5444.

NETALARM 3.0

NetAlarm, nicknamed the Smoke Detector for NetWare networks, is designed to provide the corporate support infrastructure with timely warnings on network anomalies that present the potential for network degradation or for the file server to crash. NetAlarm monitors up to eight NetWare 286- and 386-based file servers concurrently logging and providing alerts if critical errors occur or if user-defined operational thresholds are exceeded. It can run as a 12K TSR process on a workstation dedicated to other tasks, or as a foreground process on a dedicated workstation with real-time display of the statistics associated with each of the monitored File Servers. NetAlarm can be configured to send the alert to specified login names, via a NetWare message broadcast. ($495 per site) Avanti Technology, Inc., 13740

Continued

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486/386 Basic Systems

Include:
- Motherboard & CPU
- 1.2Mb or 1.44Mb Floppy Drive
- 2S, 1P, 1G Ports
- 1Mb RAM Installed
- Internal Clock/Calendar
- AT Case + 200W P.S.
- IDE 1:1 2HD/2FD Controller
- Math Coprocessor Socket
- 101 Key Enhanced Keyboard

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Basic System with 1 MB **486-50 w/64K Cache**	$ 1299
Basic System **486-33 EISA w/Cache**	$ 1338
Basic System with 1 MB **486-33 w/Cache**	$ 818
Landmark 54 MHz, Basic System w/ 1 MB **386-33 w/64K Cache**	$ 498
Landmark 30 MHz, Basic System 1 MB **386-25 w/64K Cache**	$ 448
Landmark 21MHz, Basic System with 1 MB **386-25SX**	$ 358
Landmark 16MHz, Basic System with 1 MB **386-16SX**	$ 338

COMPLETE SYSTEMS

486-50MHz w/Cache

- Basic System Configuration
- 120 MB Hard Disk IDE
- 14" SVGA Monitor (1024x768)
- with VGA card 512K

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486-33MHz w/Cache

- Basic System Configuration
- 120 MB Hard Disk IDE
- 14" SVGA Monitor (1024x768)
- with VGA card 512K

$ 1388

386-40MHz w/64KB

- Basic System Configuration
- 120 MB Hard Disk IDE
- 14" SVGA Monitor (1024x768)
- with VGA card 512K

$ 1128

386-33MHz w/64KB

- Basic System Configuration
- 120 MB Hard Disk IDE
- 14" SVGA Monitor (1024x768)
- with VGA card 512K

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386-25MHz DX

- Basic System Configuration
- 80 MB Hard Disk IDE
- 14" SVGA Monitor (1024x768)
- with VGA card 512K

$ 968

386-16MHz SX

- Basic System Configuration
- 40 MB Hard Disk IDE
- 14" SVGA Monitor (1024x768)
- with VGA card 512K

$ 768

TCI LOCAL BUS SYSTEMS

LOCAL BUS 486-50 MHz w/64K Write Back Cache COMPLETE SYSTEM **$1995**	**LOCAL BUS 486-33 MHz** w/64K Write Back Cache COMPLETE SYSTEM **$1768**
ISA 486-50 MHz w/64K Write Back Cache COMPLETE SYSTEM **$1895**	**ISA 486-33 MHz** w/64K Write Back Cache COMPLETE SYSTEM **$1695**
ISA 386DX-40 MHz COMPLETE SYSTEM **$1248**	**ISA 386DX-33 MHz** COMPLETE SYSTEM **$1198**

MONITORS & ACCESSORIES

MONITORS

Item	Price
14" IMPRESSION SVGA DOT .39	**$ 225**
14" PACKARD BELL SGVA DOT .28	$ 295
14" CLUB AT SGVA DOT .28	$ 345
14" CLUB NON-INT SGVA DOT .28	$ 385
SONY 1304 & 1604 SGVA	$ 555 / $ 1085
NANAO 9070U & 9080I SGVA	$ 898 / $ 1068
20" Nanao 9500 (72Hz Non Interlaced)	$ 1895
NEC 3FG, 4FG	$ 658/ $ 795

MODEMS

Item	Price
Modem 2400 Baud Rate	$ 45
Modem 2400 Baud Rate External	$ 75
Modem 2400 & Fax 9600	$ 85
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ACCESSORIES / MISCELLANEOUS

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Windows 3.0 and Mouse	$ 60
MS-DOS 5.0	$ 55
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Logitech First Mouse	$ 45
Logitech Mouseman (Serial or Bus)	$ 65 / $ 75
Logitech Trackman (Serial or Bus)	$ 75 / $ 85
Logitech Scanner 256 Grayscale	$ 285
Microsoft Mouse	$ 65
Everex AT Tape 120Mb / 240Mb	$ 225 / $ 280
Colorado Tape 120Mb / 250Mb	$ 225 / $ 280
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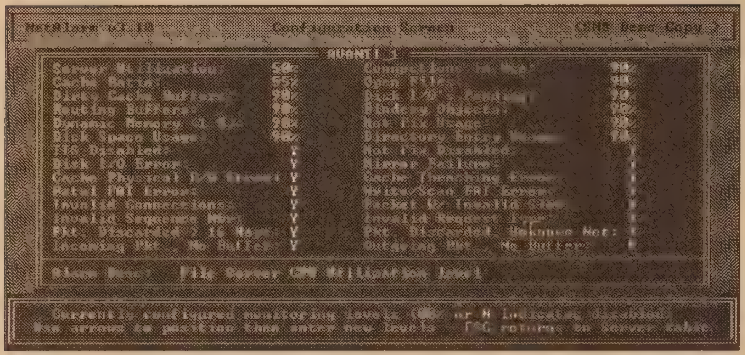


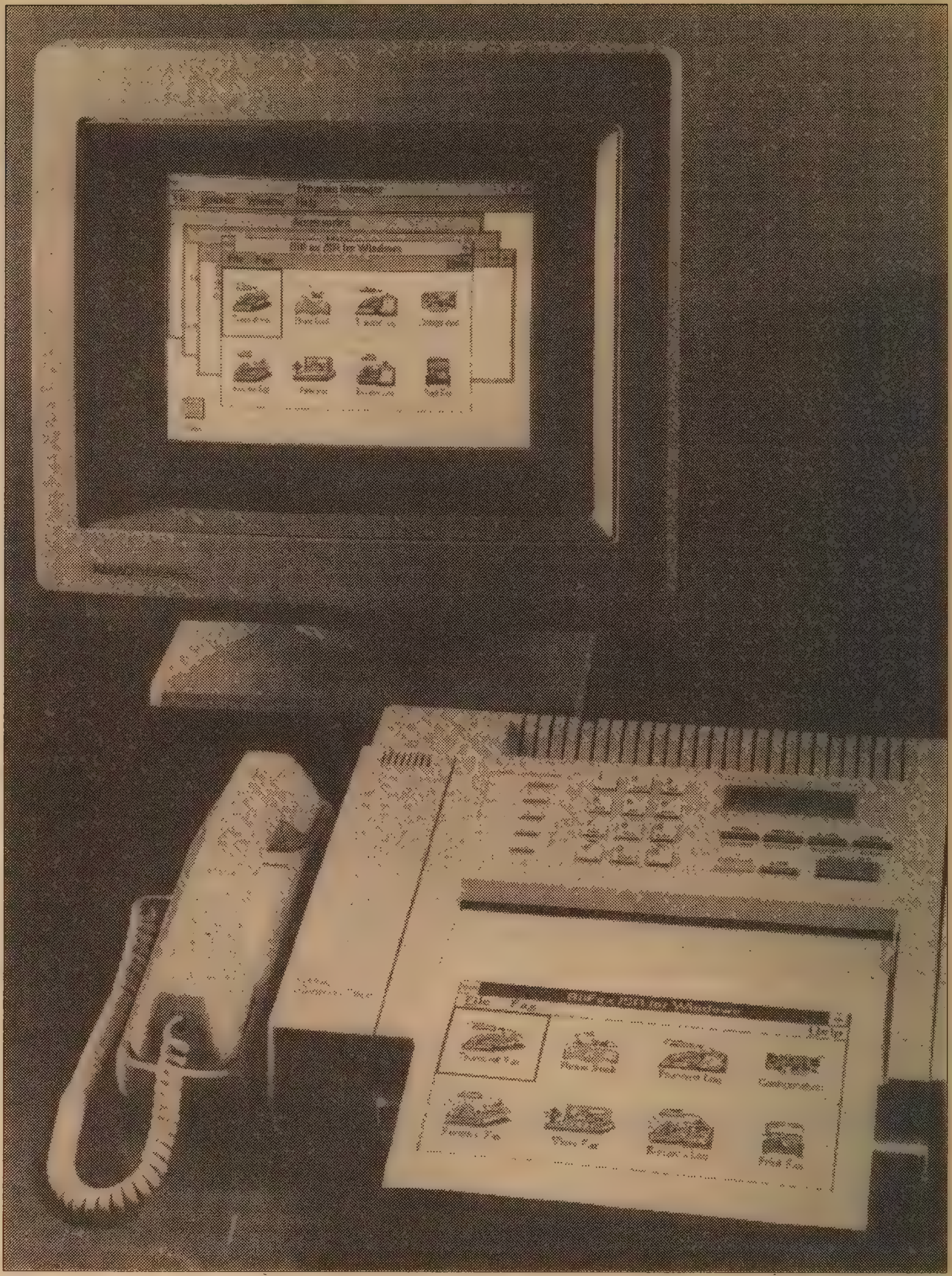
Research Blvd., #R-1, Austin, TX 78750. 1-800-AVANTI-4.

VOICEMAGIC

VoiceMagic is designed to facilitate the installation of PC voice processing applications. The latest version, v2.2, offers a full complement of auto attendant and voicemail functionality. Some of the advanced call processing features are call queuing, queue position announcement, hunt groups, and secondary call queuing. VoiceMagic offers voicemail users up to nine personal greetings, do-not-disturb, call screening, up to nine private distribution lists, up to ninety-nine public distribution lists, and message forwarding and broadcasting. Another important feature inherent in the design of VoiceMagic is the ease of adding additional application modules such as faxmail, online credit card acceptance and verification, zipcode locator, and IBM host interface. AT&S, Inc., 3402 Fernandina Rd., Ste. C, Columbia, SC 29210. 1-800-750-7279.

BITFAX FOR WINDOWS

BitFax for Windows is a full-featured Windows application that uses a PC's fax modem to send and receive faxes electronically. Installed as a print driver under Windows 3.0, users can then fax any graphic or font from any Windows application, at 200 x 200 dpi, simply by printing to the BitFax driver instead of to a printer. Other features include eight QuickDial buttons that allow single-click transmission to frequently used numbers, and a comprehensive PhoneBook using standard dBASE file format to allow database sharing with other applications. ($79) BIT Software, Inc., 47987 Fremont Blvd., Fremont, CA 94538. (510)490-9470.



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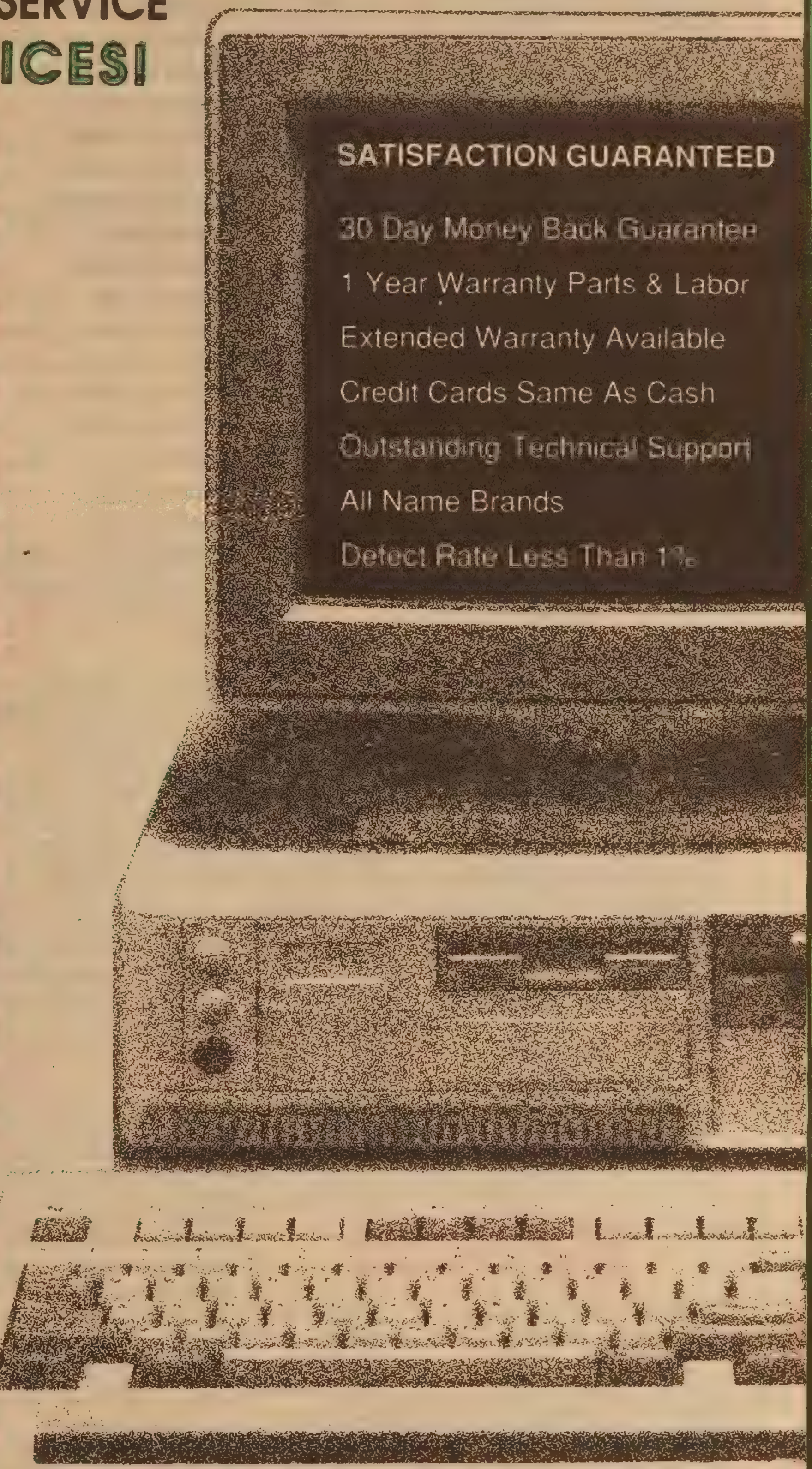

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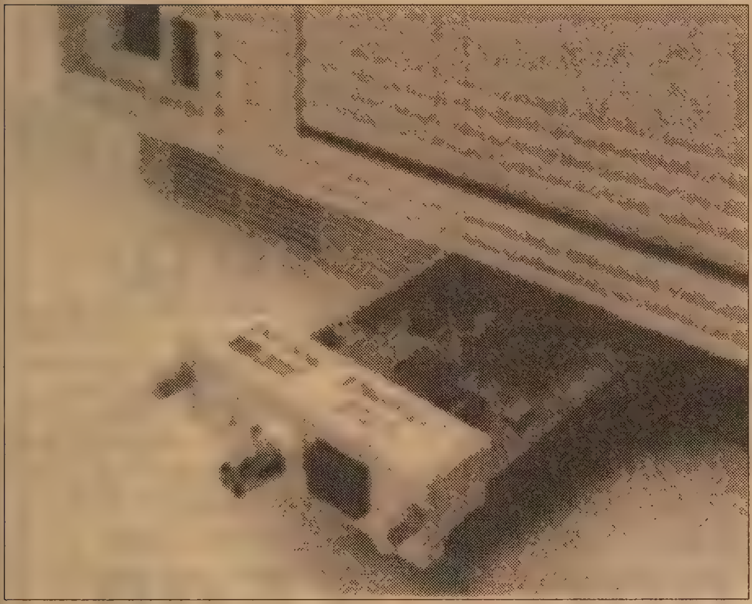
PostScript or PCL without user intervention and dynamically supports Novell NetWare 286/386, NetWare Lite, and Apple EtherTalk concurrently. This network connectivity card saves users the cost of buying a printer for each Ethernet platform. To assist network administrators with managing printers on a network connected via Ethernet, a Diagnostics Utility accompanies the product. This allows the network administrator to display status information such as error messages and network statistics on any remote PC on the Novell network. ($695) Extended Systems, Inc., 6123 N. Meeker Ave., Boise, ID 83704. 1-800-235-7576.



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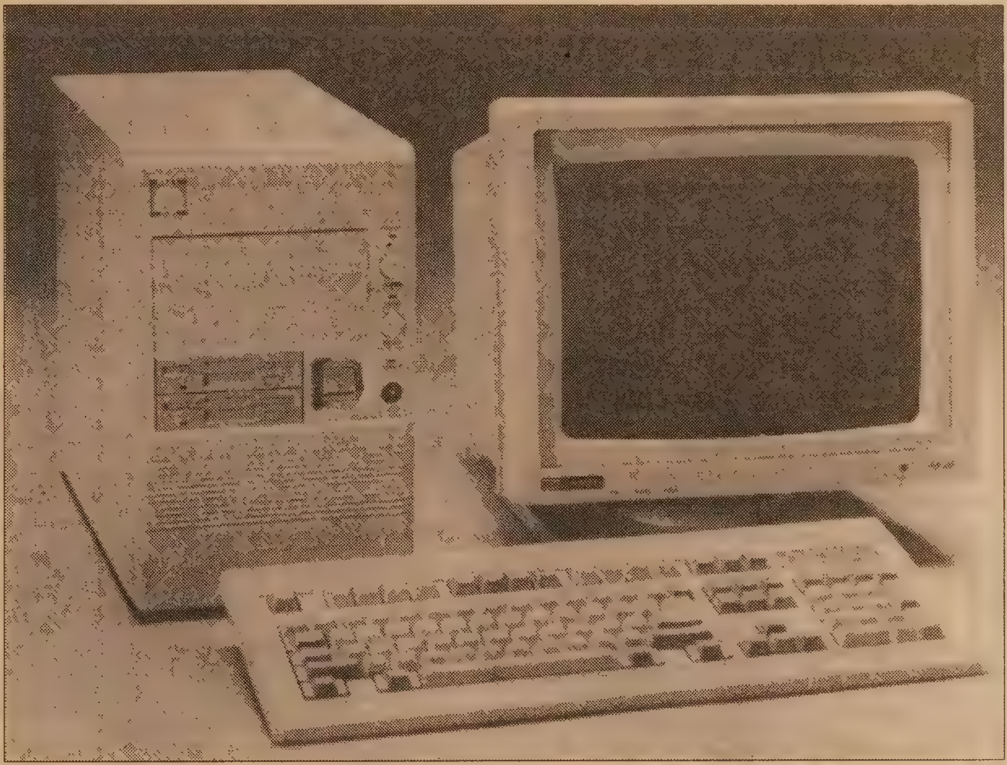
The NetFRAME NF450FT and NF250FT are fault tolerant superservers designed for mission critical networks running standard Novell NetWare or Microsoft LAN Manager software. These new servers mark the beginning of an evolution into a technology that NetFRAME calls Object-Servers. Through Object-Servers, network users can quickly and cost-effectively share and access video, sound, and data. The NF450FT supports up to ten processors and utilizes Intel's 50MHz i486 technology connecting up to eight Ethernet and/or Token-Ring LANs and supports 256MB of error detecting and correcting memory (ECC). The NF250FT supports up to five processors, expands to 33GB of disk storage, and can handle 128MB of ECC memory. (NF450FT is $69,950, the NF250FT is $29,950) NetFRAME Systems, Inc., 1545 Barber Ln., Milpitas, CA 95035. (408)434-4169.

BELL TOWER NETWORK SERVER

The Bell Tower 40MHz 386 Network Server comes complete with two SCSI controller cards, two duplexed (Conners or Quantum) 200MB hard disk drives, 8MB RAM (expandable to 64MB), a 256K write-back RAM cache, 14" monochrome monitor, 5.25" or 3.5" disk drive, and a 101-key keyboard. This server is designed for a twenty-user NetWare 386 v3.11 network. It includes a GE on-site warranty for one year, expandable to five years. The system is fully compatible with IBM PCs and the ISA bus. ($4999) Bell Computer Systems, Inc., 6615 Valjean Ave., Van Nuys, CA 91406. 1-800-922-1126.



VERILINK ACCESS SYSTEM 2000

Access System 2000, an integrated network access system, is remotely programmable to give network managers the ability to adapt to changes in applications, carrier services, and standards without changing equipment. This system integrates capabilities of subrate and T1 multiplexers, channel service units, T1 data service units, and network performance monitoring into a single highly flexible connectivity system. It is ideally suited for data and image networking at major nodes as well as remote sites. The initial capabilities of the Access System 2000 include intelligent T1 and fractional T1 interfaces for high-speed (56kbps to 1.536 Mbps) digital interconnections of LANs, workstations, and video applications as well as the 300bps to 19.2kbps required by lower-speed interface applications such as terminal interconnection. (List prices for system configurations begin at $5000) Verilink Corp., 145 Baytech Dr., San Jose, CA 95134. (408)945-1199.

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330	Fujitsu M2622SA	5Yr	9ms	$999
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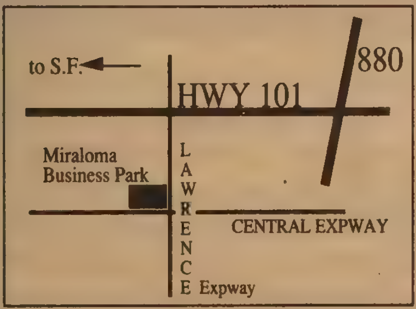

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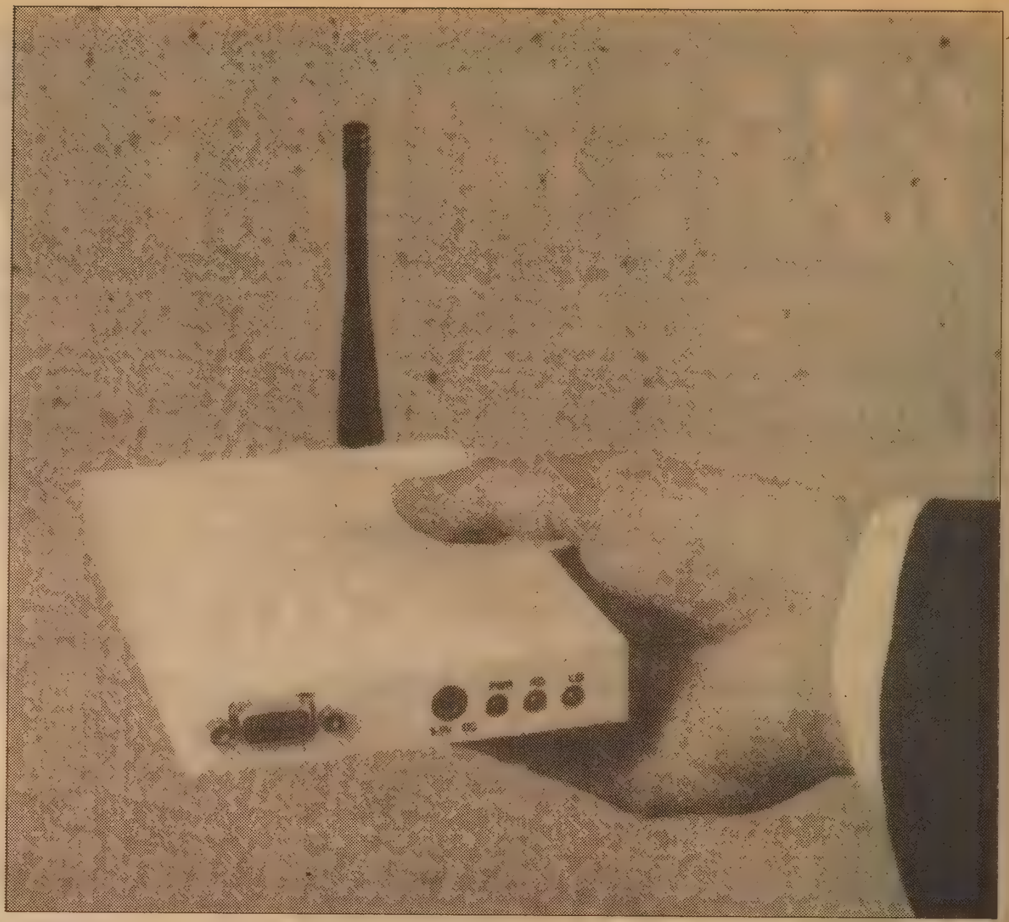
software) on a set of dual-format disks, and one or two SharedAccess V.32bis modems. All SharedAccess modems are compatible with the AT command set, and with CCITT standards for asychronous communications from 300bps and up. (Single Port version, one modem, is priced at $995; Dual Port version, two modems, is $1595) US Robotics, Inc., 8100 N. McMormick Blvd., Skokie, IL 60076. 1-800-DIAL-USR.

QUICKCOMM SPIRIT

The Spirit Series V.32 and V.32bis modems for QuickComm support data throughput up to 57,600bps. The Series is available as an external model for any computer with an RS-232 serial port or as an internal half-card for IBM PCs or compatibles. All models include Qmodem data communications software, a CompuServe introductory offer, and a five-year warranty. QuickComm has also bundled the modems with BitFax software featuring scheduling, background operation, hotkeys, fax broadcasting, viewing, and fax conversion. (The V.32 half-card is $299 and the external V.32 modem is $359) QuickComm, Co., 2290 Ringwood Ave., Suite K, San Jose, CA 95131. (408)956-9145.

PROXIM PROXLINK RADIO MODULE

The ProxLink radio module provides a simple and reliable wireless replacement for any RS-232 link up to five hundred feet apart. It is intended for use with any RS-232 device including serial terminals, data collection devices, printer connections, or RS-232 communications links. Once configured, the ProxLink accepts full duplex RS-232 data at up to 19.2K baud. The built-in network protocols allow numerous ProxLink modules to operate at the same time without interfering with each other ($1295/pair) Proxim, Inc., 295 N. Bernardo Ave., Mountain View, CA 94043. (415)960-1630.



SUPRAMODEM 9600

The SupraModem 9600 features V.32, V.42bis, and MNP 2–5, providing throughput up to 38,400bps, for under $700. V.32 has become the industry standard for 9600bps modem transmissions, regardless of the modem manufacturer. V.42bis, the international standard for error-correcting, data compressing modems, compresses data up to 4:1, providing up to 38,400bps error-free throughput when communicating with another V.32/V.42bis modem. Microcom Network Protocol (MNP) levels 2–5 are widely used error-correction and compression protocols that compress data up to 2:1. ($699.95) Supra Corp., 1133 Commercial Way, Albany, OR 97321. (503)967-9075.

SECUREMODEM 2032

The SecureModem 2032 is a full-featured V.32 modem that automatically authenticates an incoming call, performs callback or pass-through, and secures the communication session by scrambling data using DES link encryption. This double security feature protects dial-in networks for unauthorized access and secures sensitive data transmission against illegal tampering

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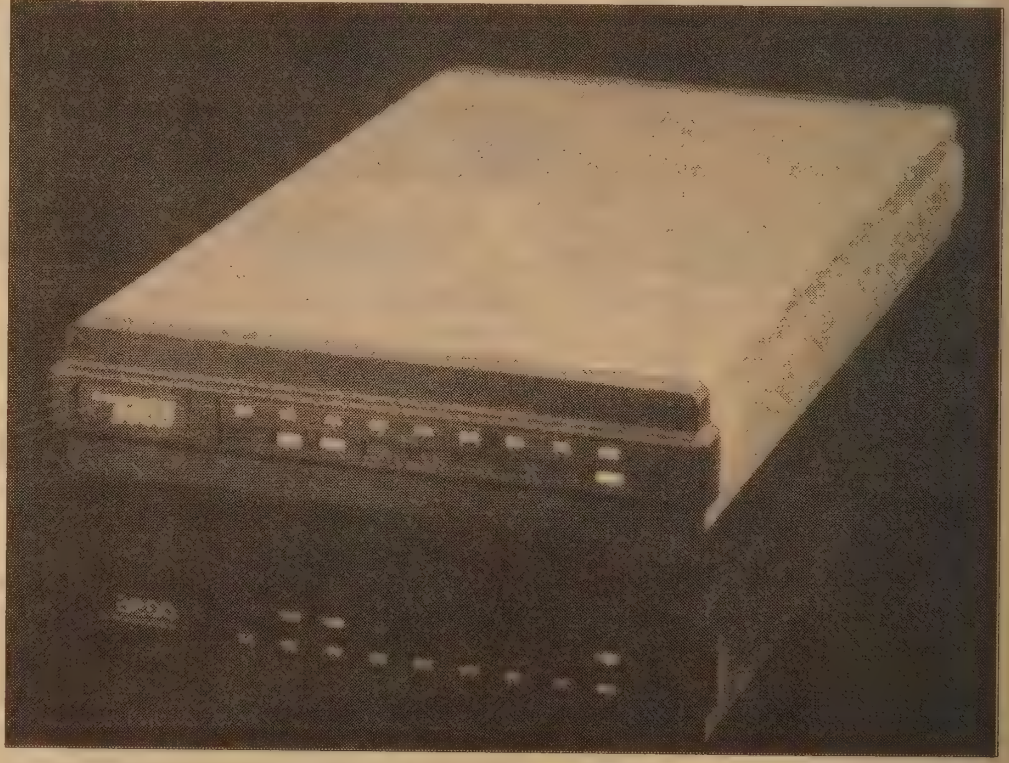

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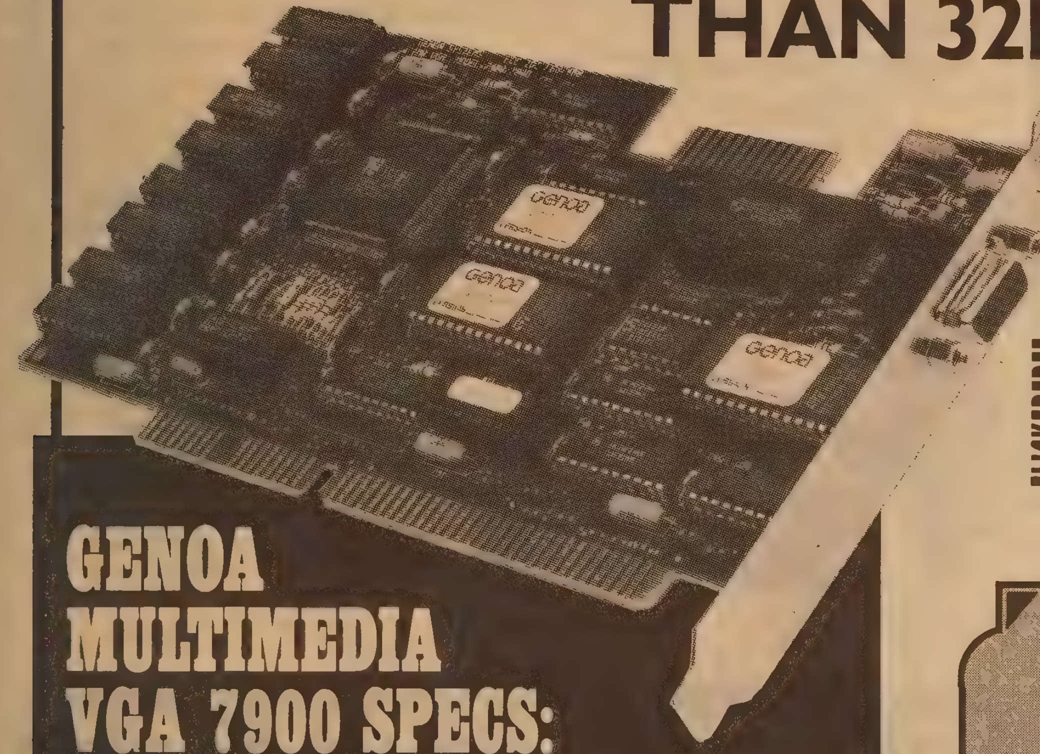

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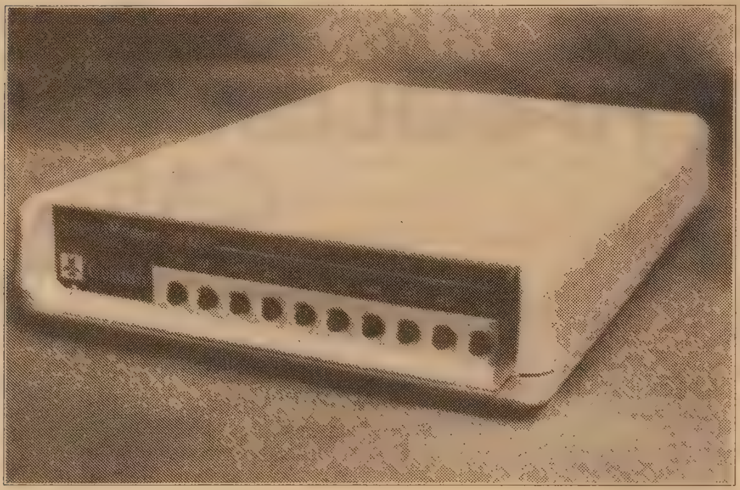

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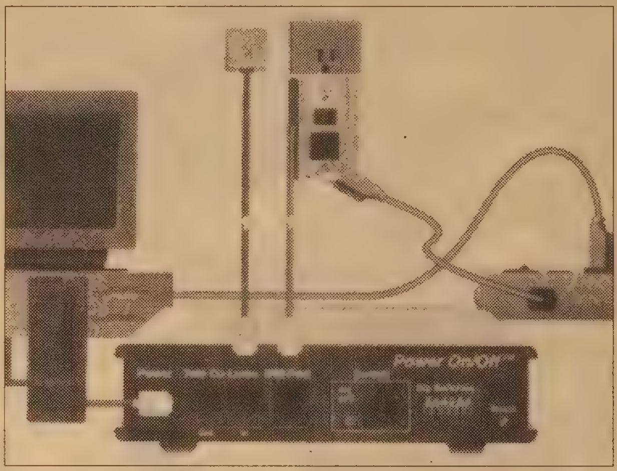

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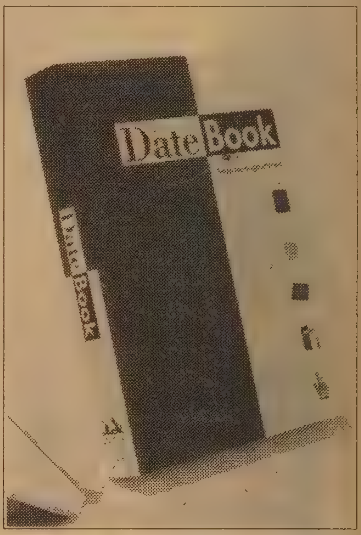

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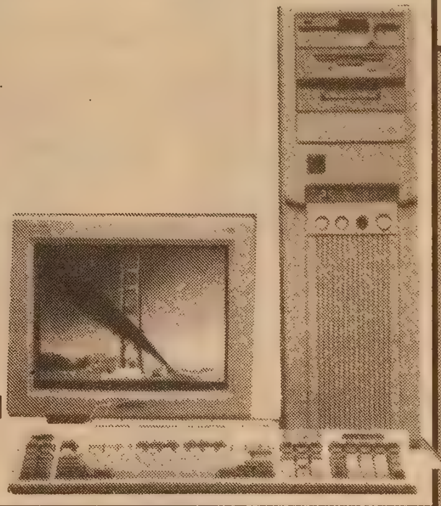

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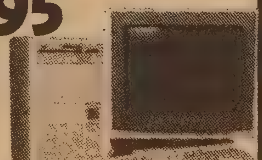

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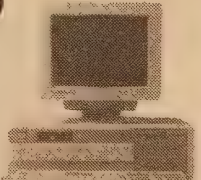

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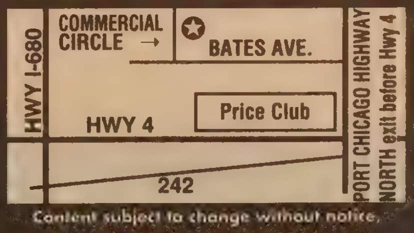

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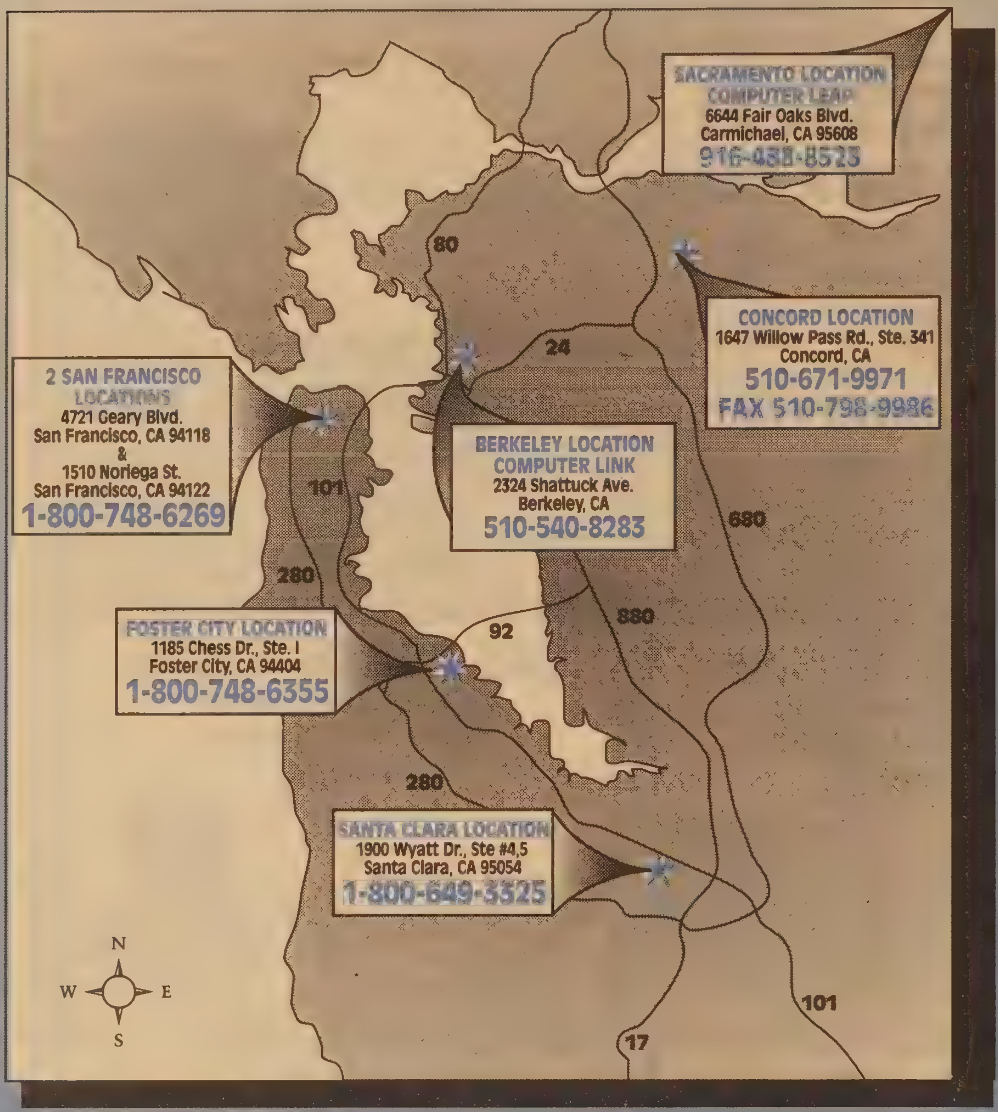

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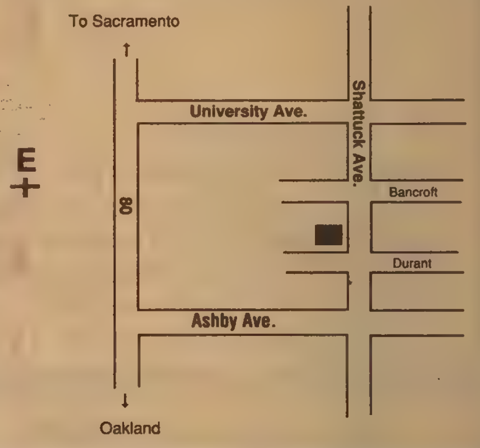

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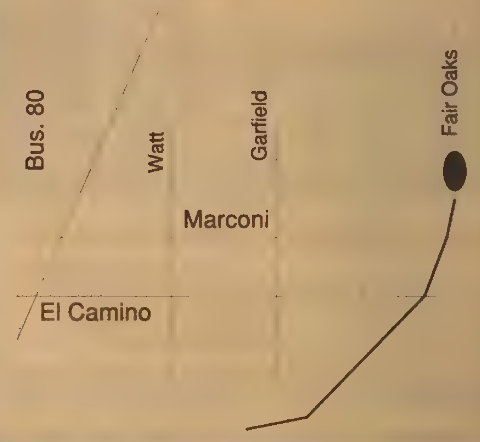

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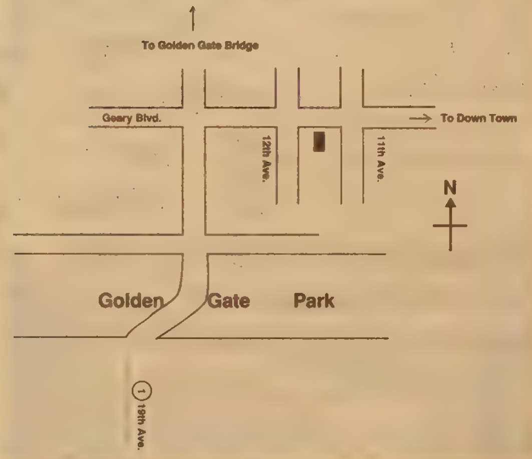

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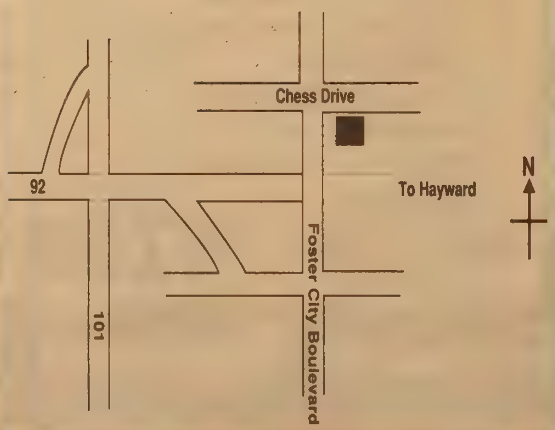

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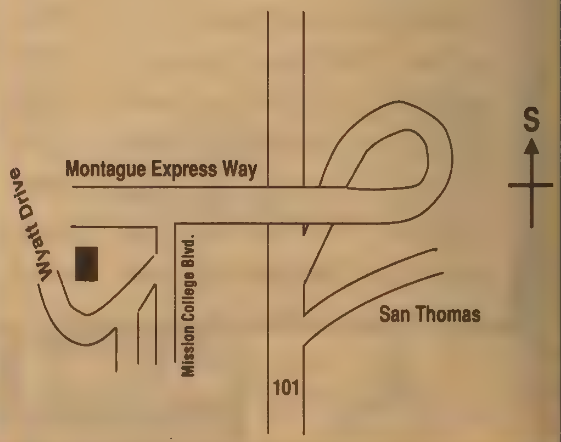

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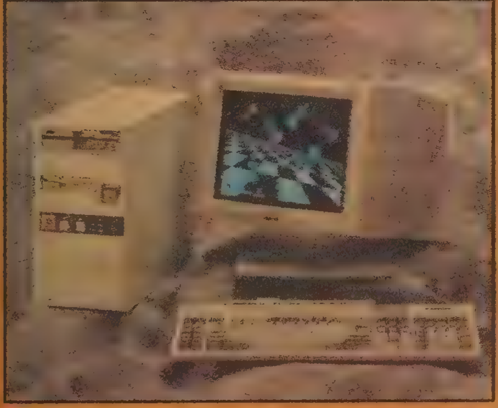

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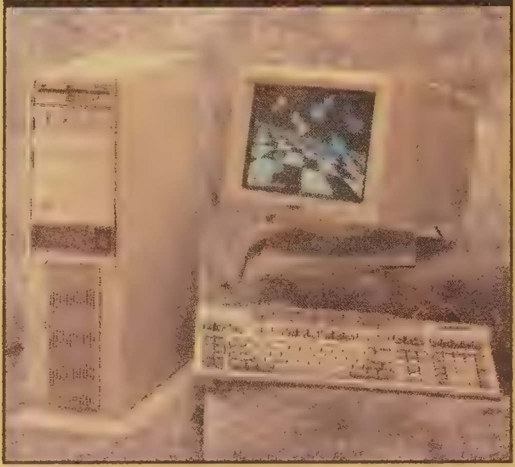

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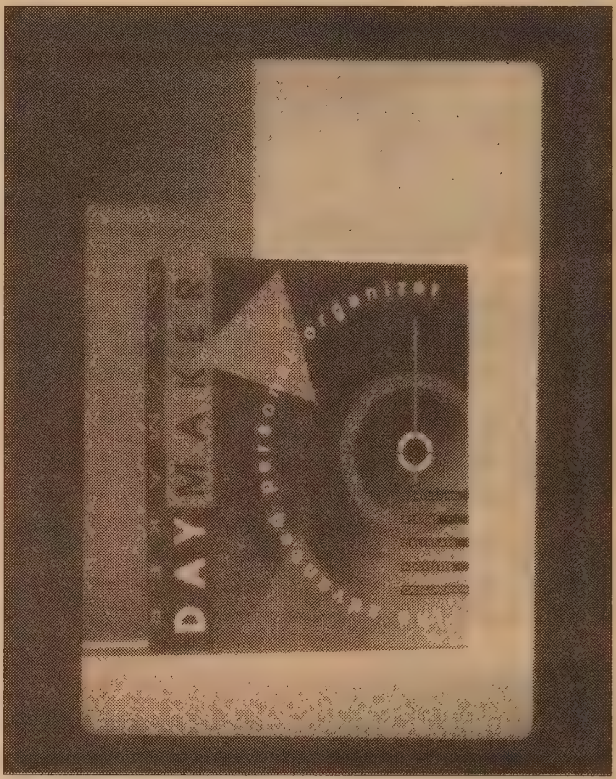
Continued from page 176

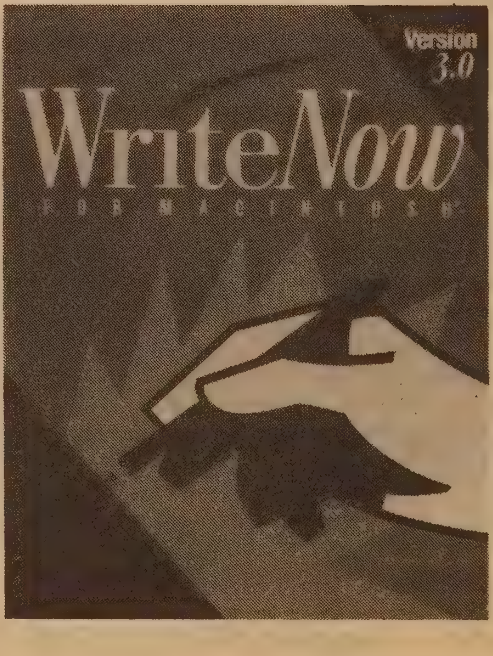
appointment and event information to the contact's TouchBASE record. DateBook's printing capabilities enable you to print your calendar in fILOFAX, DayRunner, and DayTimer formats. ($59.95. TouchBASE/DateBook bundle has a suggested retail price of $195) After Hours Software, Inc., 5990 Sepulveda Blvd., Van Nuys, CA 91411. (818)780-2220.

PASTEL DAYMAKER



DayMaker provides a comprehensive, quick solution to personal organization, combining scheduling, appointments, to-do lists, calendars, alarms, Gantt charts, addresses, phone numbers, categorization, and printing to personal organizer formats. Users can easily organize and access the most common types of day-to-day information, which may be viewed either by day, week, month, or in a list. Information can be sorted and viewed by project, category, priority, date criteria, and other attributes. The program uses centrally stored data so that changes made in one view are immediately reflected in all other views. A full range of time management tools are available, in addition to versatile output capabilities. ($99) Pastel Development Corp., 113 Spring St., New York, NY 10012. (212)941-7500.

T/MAKER WRITENOW 3.0



WriteNow 3.0 is still the fastest and most compact Macintosh business word processor available, requiring only 325K of RAM. This lets WriteNow 3.0 run comfortably on a standard 2MB Macintosh running System 7—such as the Classic or PowerBook 100. This new version boasts over sixty new features and enhancements, including features that take advantage of Apple's System 7. Top among these new features are a suite of powerful paragraph and character style sheets. There is also direct PC WordPerfect,

Continued

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486-33 EISA	$943	$1117	$1387	$1527	$1577	$1667	$1727	$1917
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486DX2-50	$660	$840	$1110	$1250	$1300	$1390	$1450	$1700
486-33/64K	$503	$657	$937	$1087	$1137	$1197	$1257	$1475
486SX-20	$303	$473	$743	$883	$933	$1023	$1083	$1333
386-40/64K	$235	$405	$675	$815	$865	$955	$1015	$1165
386-33/64K	$225	$395	$665	$805	$855	$945	$1005	$1155
386-25	$181	$351	$621	$761	$811	$901	$961	$1161
386SX-25	$132	$303	$573	$713	$763	$853	$913	$1113
386SX-16	$111	$281	$551	$691	$741	$831	$891	$1091
286-12	$57	$227	$497	$637	$687	$777	$837	$1087

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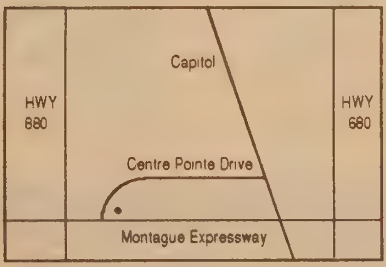

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MacWrite II, and Microsoft Works compatibility and improved Microsoft Word compatibility, and dozens of other new enhancements and improvements. Grammatik Mac, a $99 value, is bundled free with the retail version of WriteNow 3.0. ($249) T/Maker Co., 1390 Villa St., Mountain View, CA 94041. (415)962-0195.

SPYGLASS TRANSFORM 2.1

Version 2.1 of Spyglass Transform, a visual data analysis application, accepts AppleEvents, allowing users to run a series of Transform commands from other applications such as HyperCard. It also adds a scripting capability that will give scientists and engineers powerful and efficient new ways to create and animate images from their data. To help users get started scripting, Spyglass includes two demonstrations: a sample HyperCard stack and sample source code from a Language Systems Fortran program. A new template feature can save Transform commands performed on one dataset, then execute them later on another. Other enhancements include the integration of the Fiddle and a streamlined View utility. ($495. The upgrade to v2.1 is $69) Spyglass, Inc., 701 Dr., C-17, Champaign, IL 61820. (217)355-6000.

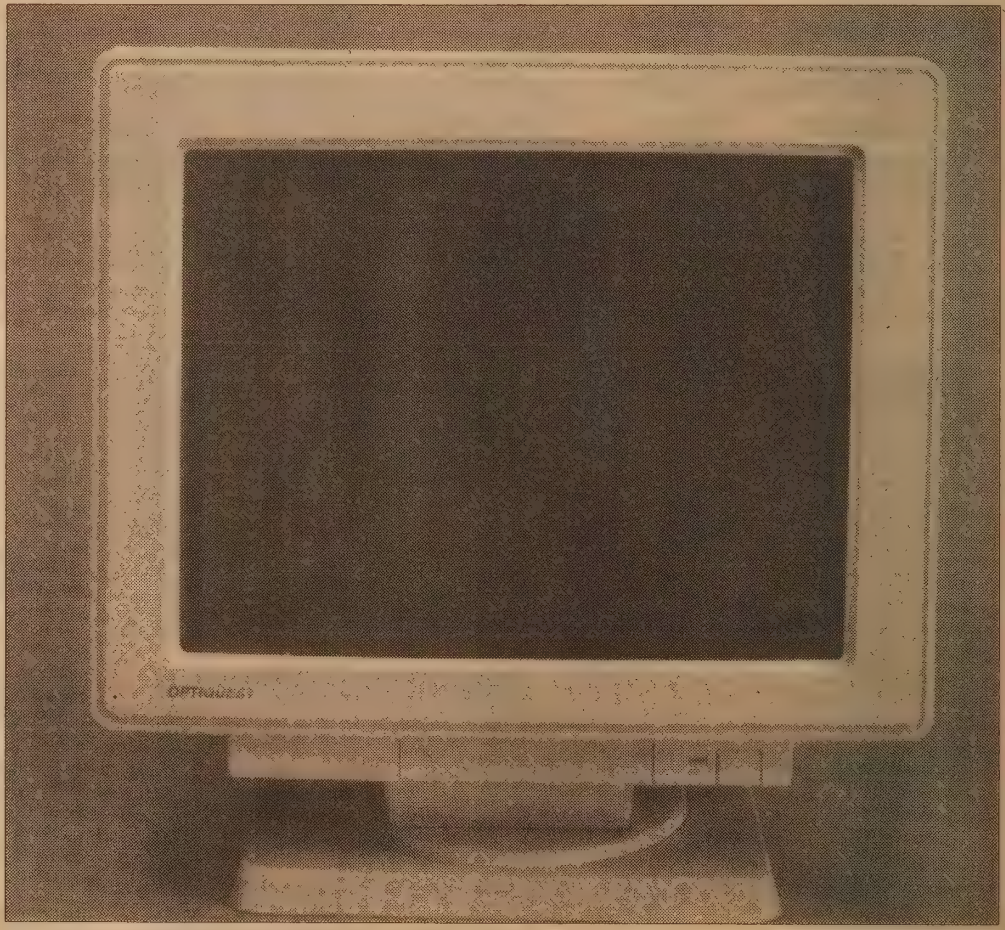
MONITORS

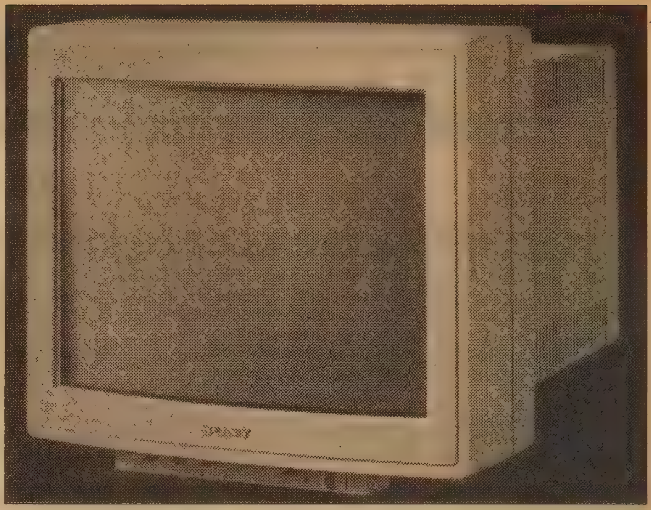
SAMTRON SC-428TX

Samtron Displays introduced a 14", non-interlaced SuperVGA monitor. The SC-428TX monitor supports resolutions ranging from 640 x 480 to 1024 x 768. The 0.28mm dot pitch is complemented by an antistatic, nonglare screen that provides clear, crisp colors while reducing reflections. Ergonomic features include front access controls, and tilt-and-swivel adjustments. It offers multi-frequency VGA and VESA capability. Samtron Displays is a unit of Samsung Electron Devices Co., Ltd. ($599) Samtron Displays, Inc., 14251 E. Firestone Blvd., #101, La Mirada, CA 90636. (310)802-8425.

OPTIQUEST 2000D

The Optiquest 2000D 15", non-interlaced, color monitor offers an infinite palette of colors for Windows, CAD, design, and spreadsheet applications. The digital front panel controls allow users to manage their monitor's display parameters with greater ease of use and accuracy. It also meets or exceeds the Swedish MPRII guidelines for lower ELF and VLF emissions. The Optiquest features a universal power supply, making it compatible with locally available power supplies anywhere in the world. Optiquest's new monitor accepts Standard VGA and Super VGA display boards and are also compatible with the IBM 8514/A and other 15-pin, high-resolution video display adapters. ($795) Optiquest, Inc., 9830 Alburtis Ave., Santa Fe Springs, CA 90670. (310)948-1185.





SONY RGM-1901

The RGM-1901 Reference Graphic Monitor is engineered for accuracy and consistency in displaying the true colors of an original scan, color print, or final film. This monitor offers a stable color response. An advanced beam feedback system eliminates the drift and color shifts inherent to ordinary monitors. The RGM-1901 is compatible with any 24-bit RGB color graphics card supporting a non-interlaced vertical refresh rate of 75Hz. The 19", flicker-free display supports 1024 x 768 resolution. ($6995) Sony Corp. of America, 3 Paragon Dr., Montvale, NJ 07645. (201)930-7796.

HITACHI SUPERSCAN

The 15" SuperScan 15 and 17" SuperScan 17 represent a new generation of multiscanning color monitors for Windows users. These are flat-screen, true-color displays, and are compatible with a wide range of graphics

Continued

BUY AMERICAN...BEST BUY!

In database server test, the **Axik** surpassed Dell, the previous leader, by 5 percent in transactions per minute (TPM). The **AXIK** was 4 percent faster than ALR. In the previous review, we attributed part of Dell's efficiency to its three-bay drive array. The **Axik** excels in this capacity with only one drive.

The **Axik ACE** is a superior high-end file server with an extremely low price.

Info World 2/24/92

All Axik Ace Cache 486-50, 486DX2-50, 486DX-33, 486SX-25 Come With The Same High-Quality Features, Performance & Architecture, Backed By 8 Years of Motherboard Design, Manufacturing and System Integration Experience.

APPLICATIONS TESTS — **INFO WORLD**

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(test times in minutes:seconds)

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PRICE	**$4,399**	**$12,889**	**$12,999**	**$12,899**
File server tests				
Office test 24-station	01:57	01:59	01:53	01:52
Database file server(2)	1.70	1.64	0.71	1.61
Workstation tests				
CPU intensive	07:24	06:29	06:23	07:32
Disk intensive	21:36	17:53	15:59	23:48
Multitasking	01:23	01:03	01:02	01:08

1)Compaq Deskpro 486/50L and Dell Powerline 450SE Reviewed January 20, page 97

2) Transaction per minute for 24 stations, with a theoretical maximum of 6.0; higher indicate better performance

Reviewed By

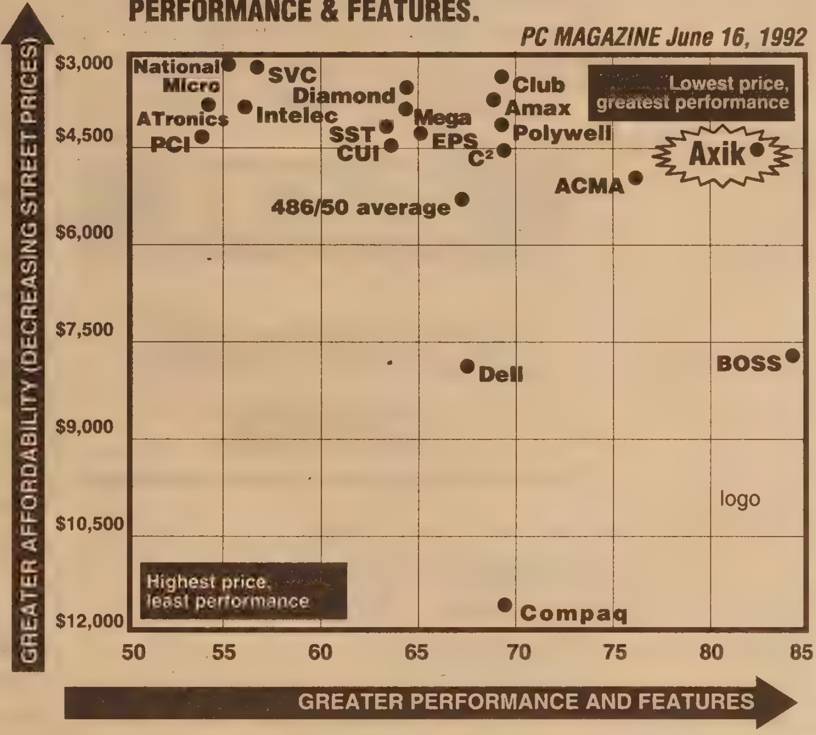
PC MAGAZINE

June 16, 1992

INFO WORLD

AXIK 486-50 SYSTEMS BEAT ALL OTHERS ON PRICE, PERFORMANCE & FEATURES.

PC MAGAZINE June 16, 1992



SYSTEM	MB +CPU	BASIC SYSTEM	BASIC + 40 MB HD +12"	BASIC + 40 MB HD +VGA	BASIC + 40 MB HD +SVGA	BASIC + 80 MB HD +SVGA	BASIC + 120 MB HD +SVGA	BASIC + 200 MB HD +SVGA
486-50C EISA	$1359	$1539	$1809	$1959	$1999	$2099	$2169	$2359
486DX2-50C EISA	1209	1389	1659	1809	1849	1949	2019	2109
486-33C EISA	1059	1239	1509	1659	1699	1799	1869	1959
486-50/256K	–	–	Best	Best	Best	Best	Best	Best
486DX2-50/64K	779	959	1229	1379	1419	1519	1589	1779
486-33/64K	559	739	1009	1159	1199	1299	1369	1559
486SX-25/64K	339	519	789	939	979	1039	1109	1339
386-40/64K	269	449	719	869	909	1009	1079	1269
386-33/64K	259	439	709	859	899	999	1069	1259
386-25	209	389	659	809	849	949	1019	1209
386SX-25	159	339	609	759	799	899	969	1159
386SX-16	139	319	589	739	779	879	949	1139
286-16	79	259	529	679	719	819	889	1079

BASIC SYSTEMS INCLUDE: M/B, CPU, 1 MB RAM, (512KB For 286) 1:1 2 FD/2 HD Controller, I/O (2S/P/G), 1.2 MB or 1.44 MB FD, Math Co-Processor Socket, Case + Power Supply, 101-Key Enhanced Keyboard.

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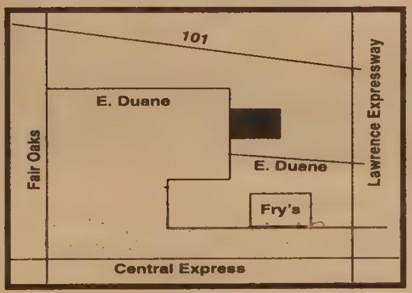

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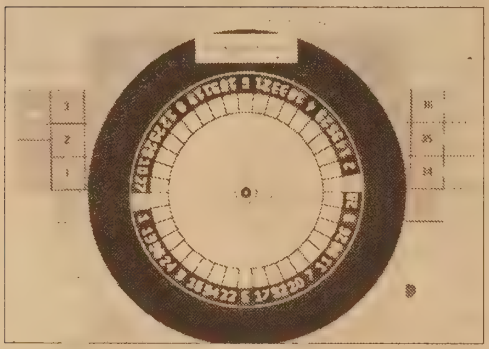
standards from VGA to XGA, and Macintosh II. They are VESA-standard compatible and fully compliant with Swedish MRPII standards. Ergonomic features include compact, lightweight cabinetry, easy-to-access front panel controls, detachable tilt/swivel base, dual inputs, and soft silica-coat treatment for antiglare displays. (The SuperScan 15 is priced at $799, and the SuperScan 17 is $1495) Hitachi Group Co., Nissei Sangyo America, Ltd., 800 South St., Waltham, MA 02154. 1-800-441-4832.

REVIEWS

PC SOFTWARE REVIEW

CASINO PAK I

Published By: The Software Toolworks
List Price: $49.95
Reviewed By: Woody Liswood



Are you bored with the Solitaire and Reversi games that accompany Windows? Do you now have an aversion to working with just plain DOS? Do you like poker, keno, blackjack, or roulette? You do! Casino Pak I, from Software Toolworks, might be just what you need.

The poker game emulates the video poker played in places like Las Vegas. You play against the computer. That is all there is to it. You win, you lose, and you can double up if you wish. This is great practice for the real thing. The graphics are reasonable, and everything works from the mouse.

The blackjack game also has reasonable graphics. Casino Pak I Blackjack follows casino rules, just like you would find them in Las Vegas or Atlantic City, and would be a good game to hone your skills before you try your luck with the real thing. You can choose to play with one, two, four, or six decks of cards, depending on what your favorite casino does on their blackjack tables. I used to count cards when I played blackjack. Using six decks shows me how little I can really count at that level. I guess I had better go back to playing bridge. In any case, Casino Pak I Blackjack also allows splitting, doubling down, and insurance bets.

I found the action realistic, but I missed playing against four or five other folks. And no one came by with a free drink to help me concentrate on my counting.

Keno, for me, is just like playing a lottery. No fun, no excitement, and no luck. Casino Pak I Keno feels the same way. You choose your numbers. The computer draws its numbers. You win or lose depending on your luck. Just like in the real world.

There are a lot of people who actually like to play roulette and in Casino Pak 1 you get to choose your poison—USA or European board layouts. You know, I didn't even know that the Europeans had a different board layout. You can practice all your betting patterns, such as even money, split, and columns. I liked the graphics, but would still prefer to visit a casino and play the real thing.

These four programs work. No UAEs, GPFs, or other untold problems. The graphics are OK. If you need the diversions, this should do it for you. If you want to practice before heading to Las Vegas or Atlantic City, Casino Pak I should help your game. (The Software Toolworks Inc., 60 Leveroni Ct., Novato, CA 94949. 415/883-3000)

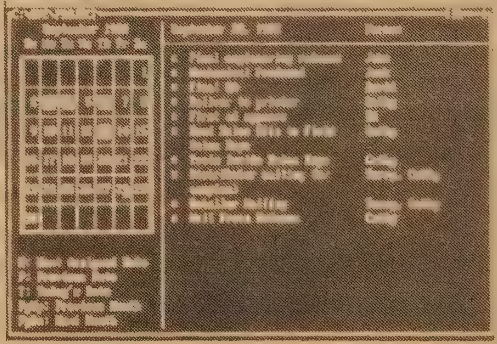
GRANDVIEW 2.0

Published By: Symantec
List Price: $295
Reviewed By: Birrell Walsh

For some tasks, an outliner is the only tool.
I. If you need to organize lists,
II. if you need sections and subsections
  A. that you can, at will:
    1. collapse,
    2. expand,
    3. annotate with extensive documents of a few lines or a few pages,
    4. reorganize,
III. then you want an outliner.

The problem is that many outlining programs force you to choose. Either you get a great outliner and a lousy word processor, or you have a fine word processor with only an elementary outliner.

The perfect hybrid does exist, though, for the DOS user. I have settled on GrandView v2.0. It is marketed by Symantec, the people who make MORE for the Macintosh.



GrandView outlines have every possible kind of outline labeling, from no labels at all, through numerical (1.2.3.), Harvard (I.A.1.c.), and bullets. There is also cross-reference by categories. You can assign outline items to categories and recover all the items in each category with a few keystrokes. While GrandView is not as flexible as Lotus Agenda, the categories make rich cross-referencing possible.

Merged with this outliner is a straightforward word processor in which I have done most of my writing for several years. All the standard formatting and print features are available. It is not WYSIWYG, but there is a print preview that helps you to save paper.

You can export to Harvard and Freelance Chart, if you have them; or to any of fifteen different outliner and word processor formats.

The combination of excellent word processor and excellent outliner is ideal for a writer or researcher. You can keep everything in one file, while concealing most of it under summary headlines. My complete contact file for the computer business—221 contacts to date—is in one compact GrandView file. If you work in the DOS world and need an outliner, GrandView is the choice. (Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014. 408/253-9600)

SIGNATURE

Published By: XyQuest, Inc.
List Price: $495
Reviewed By: John Cowan

Signature is a full-featured, graphics capable, DOS-based word processor, competitive in every respect with WordPerfect and Microsoft Word. Its release, eagerly awaited by users of its predecessor XyWrite III Plus, was delayed repeatedly while IBM waffled, and then reneged, on an agreement to market it as its product. The wait has proved worthwhile.

Offering one of the best interfaces I have yet encountered, Signature is a vast improvement over the arcane, command driven XyWrite. It utilizes the industry standard Common User Access interface, with a menuing system similar to Windows and hot key selections intuitively tailored to the IBM standard keyboard.

Signature is also the only advanced DOS-based word processor with the ability to edit in WYSIWYG mode, an invaluable time saver toward the end of a desktop publishing job when you need to get the look just right. No more tedious switching back and forth between viewing and editing modes. Factor in the ability to transfer files easily between Signature and a wide variety of word processor, spreadsheet, and database programs, and you have a very powerful writing tool.

Continued

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SMC PC-130 8-Bit Coax	96
SMC PC600WS 16-Bit Coax	141
SMC PC600FS 16-Bit Coax	216
SMC EISA 32-Bit Coax Arcnet or TP Arcnet	743
THOMAS CONRAD 8-BIT Coax Star/Bus	92/106
THOMAS CONRAD 16-BIT Coax Star/Bus	240/270
THOMAS CONRAD MC Coax Star or TP Star	258
TIARA LANCARD/A PC Coax 16-Bit	190
TIARA LANCARD/A Hiz Bus PC/AT	146/206

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AQUILA Coax 16-Bit or MC	155
3COM 3C503-16 ETHERLINK II 16-bit	199
3COM 3C503-16 ETHERLINK II 5 Pack	738
3COM 3C523B ETHERLINK/MC	290
3COM 3C523B ETHERLINK/MC 5 Pack	1,263
3COM 3C507 16-BIT ETHERLINK	299
3COM 3C507 5 Pack, (1 Doc/Drivers)	1,345
INTEL ETHEREXPRESS 16	135
INTEL ETHEREXPRESS 16 5 Pack (1 Doc/Drivers)	650
INTEL ETHEREXPRESS 32-Bit EISA	576
NOVELL NE2/2-32A 32-Bit MC	581
NOVELL/EAGLE NE1000 8-Bit	145
NOVELL/EAGLE NE2000 16-Bit	175
NOVELL NE1000 Compatible 8-Bit	125
NOVELL NE2000 Compatible 16-Bit	155
NOVELL NE2/2A 16-bit Micro Channel	271
NOVELL NE3200 32-Bit EISA	820
RACAL ES3210 32-Bit EISA	621
SMC 3016/MC Coax	219
SMC 3016 16-BIT Coax	175
SMC 3008 8-BIT Coax	144
SMC ETHERCARD ELITE 8 Coax	155
SMC ETHERCARD ELITE 16 Coax	190
SMC ETHERCARD ELITE 16 Coax 6 Pack	899
SMC ETHERCARD ELITE/A FOR PS/2	218

Token Ring

3COM TOKENLINK 4Mbps	395
INTEL TOKENEXPRESS ISA 16/4	537
INTEL TOKENEXPRESS EISA 16/4	693
INTEL TOKENEXPRESS MC 16/4	537
TIARA 16/4 16-Bit Token Ring Adapter	534
WD TOKENCARD MASTER 4Mbps 16-Bit	438

10 Base-T Twisted Pair Ethernet

HTI 10 Base-T transceiver (AUI to RJ45)	89
ACCTON 10 Base-T tranceiver (AUI to RJ45)	100
RACAL 10 Base-T transceiver (AUI to RJ45)	110
3COM 3C503-16TP ETHERLINK II 16 16-bit	209
3COM 3C503-16TP ETHERLINK II 16 5PK	825
3COM 3C523B 10 Base-T MC	334
3COM 3C523B 10 Base-T MC 5 Pack	1,500
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AQUILA 10 Base-T 16-Bit	165
AQUILA 10 Base-T MC	160
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INTEL ETHEREXPRESS 16 TP 5 Pack	675
SMC 3008 TP 8-Bit Twisted Pair	188
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SMC ETHERCARD ELITE 16 COMBO 6 Pack	1,279

External/Pocket Adapters

ACCTON RingPocket TR Adapter	546
AQUILA Pocket Ethernet Adapter BNC	225
AQUILA Pocket 10 Base-T Ethernet (RJ45)	225
AQUILA Pocket Arcnet Adapter	195
DLINK Pocket Ethernet Adapter BNC	250
DLINK Pocket 10 Base-T Adapter	250
XIRCOM Pocket Arcnet Adapter TP	247
XIRCOM Pocket Arcnet Adapter COAX	267
XIRCOM External Ethernet Adapter	413
XIRCOM External Token Ring Adapter	649
XIRCOM Pocket 16/4 Mbps TR Adapter	615
XIRCOM Pocket Ethernet II BNC	345
XIRCOM Pocket Ethernet Adapter 10 Base-T	378

SPECIALS

INTEL NETWORKING SOLUTIONS

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EISA Hub Adapter (12 ports)	720
ISA Hub Adapter (12 ports)	635
Exp. Hub Board (12 more ports)	550
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Network Printing:

Lanspool 386 w/Fax Capabilities	445
Netport II for 2 Printers (Ethernet)	544

Network Faxes:

NET SatisFAXtion Software	653
SatisFAXtion Modem/200	339
FAXability Plus Windows Faxing	100
FAXability Plus/OCR Software	193

Network Management::

LANProtect Virus Protection	740
LANSight Support v.2.11	307
NetSight Sentry for Ethernet	1,549

Hubs, Concentrators & Repeaters

ACCTON EtherRepeater 2 AUI/2 BNC	685
DLINK 4-port Internal 10 Base-T Concentrator	325
HTI 8-port 10 Base-T Concentrator	425
AQUILA 12-port 10 Base-T Concentrator	575
EXOS/MICRODYNE 16 port 10 Base-T Concentrator	660
FASTLINK 4-Port Internal Arcnet Active Hub	99
FASTLINK 8-Port External Arcnet Active Hub	199
INTEL Internal EtherExpress TPE Hub/ISA	635
INTEL Harmonica for EtherExpress TPE Hub	65
IMC Dual Port Ethernet Repeater BNC/BNC	599
IMC Multi-Port Repeater Chassis	618
IMC BNC Repeater Card for IMC Multi-Port Repeater	250
IMC 10BT Repeater Card for IMC Multi-Port Repeater	150
NETWORTH Microhub 9-Port Concentrator	449
NETWORTH Microhub 8-Port + 1 BNC Conc.	469
THOMAS CONRAD Smart Hub 8 BNC Ports	499
THOMAS CONRAD Smart Hub 16 BNC Ports	719

Network Utilities

NOVELL NetWare Lite v1.0	89
cc:MAIL DOS Platform V4.0 (New Release)	223
cc:MAIL OS/2 Platform	377
cc:MAIL WINDOWS Platform	377
cc:MAIL MacIntosh Platform	377
cc:MAIL Lan Package + 10 USERS	253
cc:MAIL Lan Package + 25 USERS	622
cc:MAIL Lan Package + 100 USERS	2,395
CHEYENNE-MONITRIX Network Mgmt.	595
CHEYENNE Utils for NetWare 286/386	262
CHEYENNE ARCserve tape software VAP	792
CHEYENNE ARCserve NLM V4.0 (up to 250 users)	1,295
CHEYENNE ARCserve NLM V4.0 (up to 20 users)	810
CHEYENNE ARCserve VAP V4.0 (5 users)	218
CHEYENNE ARCserve VAP V4.0 (10 users)	511
CHEYENNE ARCserve VAP V4.0 (any users)	879
CHEYENNE ARCserve Solo	185
FRESH TECH Map Assist	226
FRESH TECH Printer Assist	175
DIRECT ACCESS Network	366
XTREE XTNET Network File Manager	305
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PC TOOLS 7.1 w/ Antivirus 10 User Network	858

Uninterruptible Power Supplies

APC UPS Monitor Card for NetWare	80
APC250 (200watt UPS for workstations)	140
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APC SMART-UPS 400	323
APC SMART-UPS 600	411
APC SMART-UPS 900	650
APC SMART-UPS 1250	844
ELGAR IPX1100SL (1000w)	539

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GAMMANET Software	938
GAMMAPAGE	358
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OPTUS FACSys NetWare Fax Server Software	552
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COLORADO QFA-700 W/ CTRL 700 MB	1,100
TALLGRASS FILESECURE 500i (500MB)	1,058
TALLGRASS FILESECURE 1000i (1 GB)	1,599
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MOUNTAIN FS2100 2.2GB Ext. 8MM, SCSI	4,924

Server Based Kits

ARCHIVE INT. PYTHON 1.3GB DAT w/VAP	2,300
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LANtastic AE-1/T 10 Base-T Adapter	136
LANtastic AE-2 Ethernet Starter Kit	535
LANtastic AE-3 Starter Kit	560
LANtastic AE-2 Ethernet Adapter	215
LANtastic AE-3 Combo Adapter	239
LANtastic 2Mbps Starter Kit	385
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LANtastic Network Eye	199
LANtastic Central Station	410
LANtastic Peer Hub	296
LANtastic for NetWare	305

Macintosh Products

Ethernet

3COM 3C543 ETHERLINK/NB	386
3COM 3C563 ETHERLINK/SE	321
Asante MC+IIE64 Coax/MAC II	222
Asante MC+IIET64 10 BaseT/MAC II	222
Asante EN/SC 10 BaseT for Powerbook	288

Cabling Supplies

RG58/RG62 or RJ-45 Rachet BNC Crimper	75
RG58 Ethernet BNC-Crimp (100 pak)	125
RG62 Arcnet BNC-Crimp (100 pak)	125
RJ45 10 BaseT Connectors (100 pak)	40
AT&T 10Base-T Ethernet Cable (1000' min)	100
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Accessories

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CASTELLE JETPRESS BNC/10 Base-T	436
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INTEL NETPORT II for 10 Base-T	544
INTEL NETPORT II for Token Ring	775
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MICROTEST NEXT SCANNER Kit	2,553
MICROTEST PAIR SCANNER Kit for 10 BaseT	1,957
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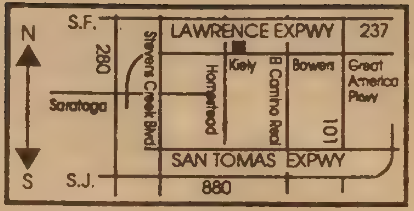

SPECIAL

3 Com 503	175
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Logitech Trackman Combo (PC and PS/2)	69
Quatro Pro 3.0	149
MS Windows 3.0	29

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III Software

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I BASIC SYSTEMS

IBM PS/1 PRO

386SX-20 Model 2123
2MB RAM (16 MB max.)
1.44 MB drive / three expansion slots
built-in VGA

80 MB HARD DRIVE

w/ monitor, 14", VGA .31	1495
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IDE Controller, 2S 1P
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MS DOS 5.0, Free MS Win 3.0

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486-33 ISA 256K cache	1165
386-33 Gemini 64K cache	765
386SX-20 Gemini 64K cache	569

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486-33 ISA 64K cache
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Mid Tower Case w/ 230W
Mitsumi 101 Keyboard
Panasonic 1395 1024x768, .28, NI
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(Made in U.S.A.)

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Mitsumi 101 Keyboard
MS DOS 5, MS Win 3.0
.... $1375

II HARDWARE

1 CD ROM

CD Caddy	$15
Speakers	25

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BlockBuster CD ROM, Corel Draw CD, Artshow CD, with SCSI interface, Internal	935

NEC

CDR-73 CD Gallery for PC w/ 7 titles w/ interface	795
CDR-73M CD ROM reader, 280ms, 300Kb/s, ext	605
CDR-83M CD ROM reader, 280ms, 300Kb/s, int	545
Interface kit for PC	89
Multimedia Upgrade Kit w/ CDR-73M includes SCSI audio board, MS Win Multimedia Extension, Asymetrix Multimedia Toolbook, stereo speakers, headphones, and microphones	call
Multimedia Upgrade Kit w/ CDR-83M	call

SONY (with controller, no software)

CDU 535-01 380ms SONY BUS int, hf ht	379
CDU 7205 380ms SONY BUS ext, hf ht	545
CDU 541-01 380ms True SCSI BUS int hf	515
CDU 541-01 without controller	425
CDU 7211 380ms True SCSI BUS ext hf	635
CDU 7211 without controller	555

Sound Blaster Pro CD-ROM Upgrade Kit

CD-ROM int, 5 CD titles (no Sound Blaster Pro)	379
MIDI Kit	59
Multimedia Upgrade Kit, internal	535
Sound Blaster	110
Sound Blaster Pro	189

CD SOFTWARE

Adobe Type On Call (Adobe Type Mgr & 13+typefaces, 1300+ encrypted Postscript Type 1 fonts which can be activated later)	call
Atlas Pack	59
Battle Chess Multimedia	49
CD Game Pack II	29
Corel Draw Artshow 1991	165
Groller's New Electronic Encyclopedia	215
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Mammals	86
Microsoft Multimedia Development Kit	299
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Mixed-up Mother Goose	39
Reference Library	65
Sherlock Holmes	45
Time Table of History	49
US Atlas	49
Wing Commander Crusade	55
World Atlas	35

2 CASES

AT Case	$50
Baby AT w/ 200W Power	90
Baby Tower w/ 200W Power	95
Mid Tower w/ 220W Power	115
Full Tower with 250W Power	150
Black Full Tower w/ 300W Power	225
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Slim Case w/ 200W (2 drive bay)	105
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2 half ht or 1 full ht, 60W	69
2 half ht or 1 full ht, 60W, 11lbs	119
3 half ht or 2 full ht, 60W, 13lbs	139
1 half ht for SCSI for Mac / PC	99/119
2 half ht or 1 full ht for SCSI for Mac / PC	139/159

3 CONTROLLERS

4 Floppies w/ IDE controller for AT	$45
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WA-6 1:1 MFM (Western Digital chipset)	59

ACCULOGIC

sIDE-2 (2 IDE hard drive only)	26
sIDE-3 (2 FD & 2 IDE HD)	29
sIDE-4 (2 FD & 2 IDE HD, 2S & 1P)	49

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1522M SCSI (controller only)	145
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1542B SCSI w/ kit (10MB/s)	279
1640 SCSI w/ kit for MCA	345
1740 SCSI EISA controller only (H only)	469
1740 SCSI EISA w/ kit (H only)	499
1742A SCSI EISA w/ kit (2F & 2H)	call
ASW-1410 ASPI MS-DOS Manager v3.0	79
ASW-310 Sy-Tos Plus (Tape Back Up software)	99
ASW-410 CD-ROM driver v2.1	79

DTC

3290AS EISA SCSI host adapter	499
6282 1:1 ESDI	125
7287 1:1 RLL	73

FUTURE DOMAIN SCSI Controller

TMC 875 for XT (F & H) w/ kit	169
TMC 1660 for AT (H only) controller only	139
TMC 1660 for AT (H only) w/ kit	229
TMC 1680 for AT (4F & H) (15MB/s) controller only	169
TMC 1680 for AT (4F & H) w/ kit	259

KOUWELL

Floppy controller (XT)	18
4 Floppies controller (XT,AT)	33
IDE controller	27
IDE controller w/ AT I/O (2S 1P 1G)	45

MICROSOLUTIONS

CompatiCard IV 4-Floppies Controller (2 ext) 360K/720K/1.2MB/1.44MB/2.88MB FD	115

ULTRASTOR

ULT 12F/32 ESDI 32K cache	155
ULT 12C/1 ESDI 1MB cache	475
ULT 22CA ESDI EISA 64Kcache	649
ULT 15C IDE cache	239
ULT 14F SCSI 32K cache	239
ULT 24F SCSI EISA 64K cache	479

4 DIGITIZERS

Calcomp 33120 12x12, 4 button	$289
SummaSketch II Plus 12x12, 4 button & pen	299
SummaSketch II Plus 12x12, 16 button	299
SummaSketch II Plus 12x18, 16 button	495
Unitech KD-4000 12x12, 4 button, 4 templates	195

5 DRIVES

Frame for 3.5" Hard Drive and Floppy Drive	$8
Removable Hard Drive Case for 3.5" HD	49

CONNER

CP-3000 40MB 25ms IDE 3.5", 1" ht	195
CP-30104 120MB 19ms IDE 3.5", 1" ht	319
CP30174E 170MB 18ms IDE 3.5, 1" ht	379
CP-3204F 200MB 16ms IDE 3.5"	545
CP-3544 500MB 12ms IDE 1" ht	1195

FUJITSU (5 years warranty by manufacturer)

M2263SA 680MB 16ms SCSI 5.25" full	1285
M2266SA 1.2GB 15ms SCSI 5.25" full	1825

IOMEGA (BERNOULLI)

Insider 44 / 90 internal master drive	825/820
Transportable 44 / 90 external drive	935/855
Bernoulli 44MB / 90MB 3-pak disks	275/440

MAXTOR

8760-760H 676MB 16ms ESDI 5.25" full	1195
MXT-7080A 80MB 17ms IDE 3.5" 32K cache	269
MXT-7120A 130MB 15ms IDE 3.5"	325
MXT-7213A 213MB 15ms IDE 3.5", 1" ht	489
LXT 213A 213MB 15ms IDE 3.5"	565
LXT 340A 340MB 13ms IDE 3.5"	785
LXT 7120S 130MB 15ms SCSI	335
LXT 213SY 200MB 15ms SCSI 3.5"	579
LXT 340S 340MB 13ms SCSI	925
8760S-760 676MB 16ms SCSI 5.25" full	1285
PO-12 1.2GB 13ms SCSI	1699
PI-17S 1.7GB 13ms SCSI	2235

MICRO SOLUTIONS (External Hard Drive)

40MB External Drive (printer port)	365
100MB External Drve (printer port)	475

PLUS DEVELOPMENT (Hard Card)

Hardcard II XL 50 50MB, 9ms	305
Hardcard II XL 105 105MB, 9ms	425

QUANTUM

LPS-105AT 105MB 17ms IDE	309
LPS-120AT 120MB 16ms IDE 256K cache	329
LPS-240AT 244MB 16ms IDE 256K cahce	625
LPS-105S 105MB 17ms SCSI 64K cache	349
LPS-120S 120MB 16ms SCSI 256K cache	379
PRO-425S 425MB 14ms SCSI 64K cache	1075

SEAGATE

ST-351A 40MB 28ms IDE 3.5"	195
ST-3096A 89MB 15ms IDE 3.5"	315
ST-3144A 130MB IDE 3.5"	369
ST-1239A 211MB 15ms IDE 3.5"	565
ST-4097 80MB 28ms MFM	255

SYQUEST (Uses Removable cartridges)

All drives comes with controller, and one removable cartridge

SQ44i 44MB internal	call
SQ44e 44MB external	590
SQ400 44MB removable cartridge	79
SQ88i 88MB internal	call
SQ88e 88MB external	call
SQ800 88MB removable cartridge	119

SYSGEN (External Floppy Drive)

Portable EasyFloppy 3.5"/5.25" for laptop	235

TEAC (Floppy Drive)

360K 5.25"	59
720K 3.5" w/ frame	57
1.2MB 5.25"	59
1.44MB 3.5" w/ frame	57
2.8MB 3.5" w/ frame	99
Dual Floppy Drive 1.2MB & 1.44MB	159

6 FAX MACHINE

SHARP

FO-130	$389
FO-216 automatic paper cutter	452
FO-240 error correction mode	529
FO-334 remote retrieval	585

7 I/O CARDS

EVEREX

Magic AT I/O (1S 1P)	$49
Magic AT I/O w/ Game port (1S 1P 1G)	57
Magic AT I/O Plus (w/ 16C550UART chip) (1S 1P)	62
Second serial port for above AT I/O cards	25
HAYES ESP enhanced serial port-data comm (2S)	209

KOUWELL

1 Serial w/ NS16550AFN chipset (XT, AT)	40
4 Serial ports card	85
AT I/O (2S 1P) / AT I/O (2S 2P)	27/33
AT I/O w/ IDE (2S 1P 1G)	45
Printer Card / Serial Card (XT, AT)	15/15

8 KEYBOARDS

FOCUS

2001 101 click	$45
8000 111 w/ calculator	49
5001 130 keys w/ cursor accelerator	64

NORTHGATE OMNI

101NI	69
102	69
Ultra T	95

SIIG (click)

Suntouch Jr. 84-key mini keyboard	49
Suntouch 101	57

OTHERS

BTC 84-key mini keyboard	39
KEYTRONIC 101	45
MAXI 101	35
MITSUMI 101	35

9 LASER PRINTER ACC.

ADOBE . . . see Adobe in Software section

COMPUTER PERIPHERALS

Jet Page (for HP II)	$295

HP . . . see HP in Printer section #20

IQ ENGINEERING

Super Cartridge 1 for all HP Laser&True HP Compatibles	139
Super Cartridge 2 for HP II, IID, IIP, IIP+, III, IIID	249
Super Cartridge 2 & 2LC	269
Super Cartridge 3 Pro+ for HP III,IIID,IIIP,IIISI	249

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MORE ON THE NEXT PAGE

Super Cartridge 3 Creative Collection for III family	249
Desk Jet 500 Professional	99
Desk Jet Plus Professional	99
LASER MASTER	
WinJet 800 800dpi, Postscript adapter for HP II,IID,III,IIID (requires 8MB in system)	699
PACIFIC DATA	
25 in One! III (for Deskjet 500)	105
25 in One! III (for HP II, IID, IIP, IIP+, III, Microtek)	245
Complete Font Library for HP III, IIID, IIIP	255
Font Bank (NEW) (for all HP Laserjet) stores soft fonts, 0.75MB / 1.5MB	205/269
Headlines Cartridge for HP II, IID, IIP	185
MacPage Driver and Connection Kit for Mac & HP II, IID, IIP, IIP+, III, IIIP	95
Paicfic Connect (for HP II, IID, IIP, IIP+, III, IIID, IIIP) connect up to 5 PC and/or Mac to a printer	
256K	265
1.25 MB	299
Pacific Page & 2MB (Postscript for HP II)	389
Pacific Page P.E. (for HP IID,IIP,IIP+,III,IIID, IIIP)	269
Pacific Page P.E. & 2MB	405
Pacific Page P.E. & Pacific Talk for Mac & HP IID, IIP, IIP+, III, IIID, IIIP	399
Pacific Page XL (for HP IIP, IIP+, III, IIID, IIIP) Postscript emulation cartridge comes with 2MB & accelerator board 8 times faster than other cartridges	649
Pacific Page XL & Talk for Mac and HP IID, IIP, IIP+, III, IIID, IIIP	785
Pacific Print for network & HP II, IID, IIP, IIP+, III, IIID, IIIP	99
Plotter in a Cartridge (for HP II)	225
Plotter in a Cartridge P.E. for HP IID, IIP, IIP+, III, IIID, IIIP	225
1-2-4 Plus (for HP II, IID)	
1MB	115
2MB	155
4MB	235
Pacific 4 Memory (for HP IIP, IIP+, III, IIID, IIIP)	
1MB	95
2MB	135
4MB	215
Pacific Si Memory (for HP IIISi)	
1MB / 4MB	85/215
LP Memory (for IBM 4029E)	
1MB / 2MB	129/179
3.5MB	249
Pacific T Memory (for Epson 6000)	
2MB / 4MB	209/299
PANASONIC see Panasonic in section #20	
MEMORY for Laser Printers: Canon, Epson, HP IBM, Okidadta, Panasonic, QMS, TI.	call

10 MATH CO-PRO, CPU

CHIP TECHNOLOGY	
80387-SX20/SX25	109/119
80387-DX25/DX33	139/145
CYRIX	
83S87 - SX16	$109
83S87 - SX20 / SX25	119/129
83D87 -25	159
83D87 -33	164
83D87 -40	179
INTEL	
80287XL (for all 286DX)	89
80387 - SX16	129
80387 - SX20	139
80387 - 33 (for all 386DX)	195
RapidCAD Engineering Co-Processor for 386DX	call
386DX - 25 CPU	110
386DX - 33 CPU	120
386DX - 40 AMD CPU	120
486DX - 25 CPU	385
486DX - 33 CPU	429
486DX - 50 CPU	740

11 MEMORY CARDS

ACCULOGIC	
RAMpAT! up to 16MB(SIMM),16 bit(AT)	$99
SIMM-ply Ram, 8/16 bit, 8MB (SIMM) max, XT,AT	145
SIMM-ply Ram PS/2, 16 bit, 8MB max, PS/2-50,60	169
SIMM-plyRam PS/2-32,32bit,8MB max,PS/2-70,80	179
EVEREX (all come 0K on board)	
XT 2MB, EMS	55
Ram 3000 Deluxe (up to 3MB, EMS, for AT)	84
Ram 8000 (up to 8MB, EMS, for AT)	165
Ram 10000 (up to 10MB, EMS, for AT)	125
Ram II 4000 (PS/2-5,6,7,80)	175
INTEL	
Above Board w/ 512K	275
KOUWELL	
640K RAM Card (XT only)	25
KINGSTON MEMORY for Apple,Compaq,IBM	call

12 MEMORY CHIPS

DRAM	
1 MB x 1 - 8	$4.35
256K - 8	1.09
256K x 4 - 8	4.50
64K - 10	1.09
64K x 4 -8	1.65
SIMM	
4 MB x 9 - 6 / 7 / 8	149/139/135
1 MB x 9 - 6 / 7 / 8	38/35/34
256K x 9 - 8	11
Mac : 1 MB x 8 - 8	33
4 MB x 8 - 7	115
PS/2 : 256K x 36 = 1MB	59
512K x 36 = 2MB	109
1MB x 36 = 4MB	139
2MB x 36 = 8MB	269
SIPP	
1 MB x 9 - 8	37
256K x 9 - 8	12
KINGSTON MEMORY for Apple, AST, AT&T, Compaq,IBM,Nec,Sun	call
LASER PRINTERS MEMORY UPGRADE for HP and Panasonic	see #10 or # 20

13 MODEMS & FAX

Konnexx 108 Connects modem to any telephone	$119
MaxPower Intelligent power strip 6-outlets, power-up & power-down computer when a fax/modem call is received. With line surge protection, UL approved	75
EVEREX	
Evercom 2400 Baud Internal	79
Evercom 2400 Baud Internal w/ MNP5	139
Evercom 9600 v.32,v.42,v.42bis,MNP5 Internal	495
Evercom 2400 Baud External w/ MNP5	185
Fax Modem 2400/9600 Internal w/ MNP5	239
Pocket Modem for Laptop 2400 w/ MNP5	215
FRECOM	
Fax 96	95
Fax 96 w/ 1 Liner & Far Fetch Fax	135
Fax 96 & modem for DOS	119
Fax 96 & modem for Windows	129
Fax 96 w/ 1L&FFF & modem for DOS	169
Fax 96 w/ 1L&FFF & modem for Windows	189
HAYES	
Optima 96 v.32,v.42,v.42bis, MNP 5, Ext	389
Pocket edition 2400 w/ Smartcom EZ	129
SmartModem 2400B Internal	245
SmartModem 2400B External	285
Ultra 96 x.32,v.32,v.42,v.42bis,MNP5 Ext	635
Ultra 144 x.32,v.32,v.32bis,v.42,v.42bis, MNP5, Ext	769
V-series SmartModem 9600 v.42,v.42bis,MNP5,Ext	489
INTEL	
9600EX v.32,v.42,v.42bis Ext	459
14400EX v.32,v.32bis,v.42,v.42bis Ext	555
Faxibility Plus/OCR for Windows	call
SatisFaxtion Modem/200 internal 96/24 fax modem v.42,v.42bis,MNP5,fax from DOS/Win application Smart line sharing, Smart UART buffering, WYPIWYF	309
SatisFaxtion Modem/400 internal 96/144 fax modem v.32,v.32bis,v.42,v.42bis,MNP5, fax from DOS/Win application,smart UART buffering, smart line sharing, WYPIWYF	449
SatisFaxtion Modem/400e external 96/144 fax modem v.32,v.32bis,v.42,v.42bis MNP5, fax fromDOS/Win application, 4K data buffer,WYPIWYF	499
MACRONIX	
MaxLite 96/PC pocket faxmodem v.32, v.42, v.42bis MNP5, w/ WinFax software	348
MaxLite 144/PC pocket fax modem v.32bis, v.42, v.42bis, MNP5, w/ WinFax software	409
PRACTICAL PERIPHERALS	
PM14400FX96 (14.4 modem 96 fax) v.32bis, int	399
PM14400FX96SA v.32bis, ext	439
US ROBOTICS	
Courier 144 v.32,v.32bis,v.42,v.42bis,MNP5, Int	535
Courier 144 v.32,v.32bis,v.42,v.42bis,MNP5, Ext	555
Courier HST-DS144 (features as above), Ext	775
Sportster 96 v.32,v.42,v.42bis,MNP5, Int	289
Sportster 96 v.32,v.42,v.42bis,MNP5, Ext	329
Sportster 96/96 FAX MNP5, Ext	319
Sportster 14.4 v.32bis, v.42bis, Int	319
Sportster 14.4 v.32bis, v.42bis, Ext	349
Sportster 14.4/FAX MNP5, Ext	359
Shared Access Modem Sharing Kit	675
ZOLTRIX	
2400 baud modem w/ MNP5, Int	49
96/24 send & receive fax/modem w/ MNP5, Int	85
96/24 send & receive fax/modem MNP5 v.42, Int	115
Pocket send & receive fax/modem, Ext	169
ZOOM	
96/24 fax modem v.42bis, MNP5 Int / Ext	135/159
96/96 fax modme v.32, v.42bis, MNP5 Int / Ext	245/call
144/144 fax modem Int / Ext	call/call

14 MONITORS

GOLDSTAR	
1460 Plus 14" 1024x768	$299
MATSUSHITA (VIEWSONIC)	
Viewsonic 1 14", 640x480, .39, Int	235
ViewSonic 4e 14" , 1024x768, .28, Int	319
ViewSonic 5 14" , 1024x768, .25, NI	515
ViewSonic 5+ 14", 1024x768, .25, NI	545
viewSonic 5e 14", 1024x768, .28, NI	445
ViewSonic 6 14", 1024x768, .28, NI	365
ViewSonic 7 17", 1280x1024, .28, NI	1095
ViewSonic 8 20", 1280x1024, .31, NI	1655
MITSUBISHI (w/ base)	
HL6605ATK 16", 1280x1024, NI	925
HL6945ATK 20", 1280x1024, .31, NI	1745
BNC Cable	39
NANAO	
9070U 16", 1024x768, .28 NI	855
9080i 16", 1280x1024, .28 NI	1015
T560i 17", 1280x1024, .25, NI	1895
F550i 17", 1280x1024, .28, NI	1175
T660 20", 1280x1024, .31 NI	1845
T660i 20", 1280x1024, .31, NI, Trinitron	2595
NEC	
3FGX 15", 1024x768, .28	649
4FG 15" Flat, 1024x768, .28, NI	749
5FG 17" Flat,1280x1024, .28, NI	1375
5D 20", 1280x1024, .31	1950
6FG 21" Flat, 1280x1024, .28	2895
NORTHMAN	
3B 14" 1024x768, .39, Int	259
3E 14" 1024x768, .28, Int	289
4D 14" 1024x768, .28, NI	339
PANASONIC	
C1381i 14" Super VGA, 1024x768, .28, Int	325
C1395 14" 1024x768, .28, NI	445
C1991 20" 1024x768, .31, NI	1545
POWER II	
3E 14" Super VGA, 1024x768, .28, Int	299
4E (AOC) 14"Multisync, 1024x768, .28, NI	349
SAMSUNG	
MA2565 12" mono amber	75
MZ4571 14" mono paperwhite	115
ML4571 14" VGA mono 640x480	125
CVM4967 14" 1024x768, .28	305
CSD5577 15" Flat, 1024x768, .28, NI	525
CSA 7571 17", 1024x768, .31, NI	875
SEIKO	
CM1450 14", 1024x768, .25, NI	529
CSF7487 17", 1280x1024, .26, NI	1055
CM2050 20", 1024x768, .31, NI	1650
SONY	
1304S 14", 1024x768, .25, NI	569
1604S 17", 1024x768, .25, NI	1055
1936 20", 1280x1024, .30 NI	2455
TAXAN	
UV1000 20",1280x1024,.31,NI refurb/new.	1395/1850
WYSE	
370 14" 640x480, .31, 64colors, dual port	795
ANSI 105 / ASCII Keyboard	125

15 MOTHERBOARDS

286-16	$125
386-33 128K cache w/o CPU	165
DTK	
386SX-20	195
386-25 w/o cache	285
386-33 64K cache	360
486-33 64K cache (Novell certified)	775
MICRONICS	
386SX-20 Gemini, Phoenix BIOS (32MB max)	265
386SX-25	250
386-33 64K cache Gemini (32MB max)	445
486SX-20	555
486-33 256K cache ISA	845
486-33 256K cache EISA E2	1145
486-50 256K cache ISA	1345
486-50 256K cache EISA	1699
MICRONICS ACCESSORIES	
4MB Piggy Back (up to 8MB)	455
16MB Memory Card	150
upgrade to 256K cache	80
NICE	
486-33 64K cache	655
486-50 256K cache	1045
486-50 256K cache EISA	1499
upgrade to 256K cache	60
ORCHID	
486-33 64K cache, AMI BIOS (32MB max)	795
386-40 128K cache, AMI BIOS (32MB max)	525
486-50 256K cache ISA	1299
upgrade to 256K cache	80
SPRITE	
SM386-33 128K ache	295
SM386-40F 128K cache	310
SM486-33 128K cache	615
SM486-33 256K cache	635
SM486-40 256K cache w/ fan kit	675
VSLI 286-12	115

16 MOUSE

AERO	
IMPC-60 3 button mouse	$18
IMPC-40 trackball	29
APPOINT	
MousePen Pro for PC / Portable / Mac	$67
Thumbelina for PC / Portable / Mac	67
GENIUS	
CLIX 3-button	19
GM-F302 mouse (3 button, PS/2 compat)	42
KENSINGTON	
Expert mouse (serial trackball)	99
LOGITECH	
Cordless Mouse	79
Dexxa Serial Mouse	27
First Mouse Serial	37
FotoMan Digital Camera for DOS System	555
Mouseman Bus	64
Mouseman Serial PS/2 combo	65
Mouseman Serial w/ Win 3.0 /WIN 3.1	75/115
Scanman 32	147
Scanman 32 with OCR software	189
Scanman 256	259
Scanman 256 with OCR software	299
Trackman Bus	69
Trackman Portable	99
Trackman Serial	59
Trackman Combo	69
MICROSOFT	
Ball Point Mouse (portable)	119
Bus Mouse 400PPI	85
Bus Mouse (400PPI) w/ Windows 3.1	149
Serial Mouse 200PPI	69
Serial Mouse 400PPI	85
Serial Mouse (400PPI) w/ Windows 3.1	149
MOUSE SYSTEMS	
Omni Mouse (2 button)	29
PC Mouse III Serial (optical)	69
PC Mouse III Bus w/ Power Panel (optical)	89
PC Trackball II	55
The White Mouse w/ Power Panel	56

17 NETWORK

3COM	
3C503 8 bit coax ethernet	183
5 packs (5 boards 1 manual)	799
3C507 16 bit coax ethernet / 5 packs	279/1250
3C503-TP 8 bit TP ethernet / 5 packs	243/1050
3C507-TP 16 bit TP ethernet / 5 packs	299/1450
3C523B Etherlink/MC for PS/2 / 5 packs	289/1210
3C523B-TP TP for PS/2 / 5 packs	319/1435
ARTISOFT	
Lantastic AE-2 Ethernet starter kit,10Mbps v4.1	459
Lantastic AE-3 Ethernet starter kit,10Mbps v4.1	535
Lantastic 10BaseT starter kit v4.1	595
Lantastic 2Mbps starter kit v4.1	355
Lantastic Z (2 stations) v4.1	89
Lantastic /AI software (individual node) v4.1	69
Lantastic Ethernet Software Kit (NOS) v4.1	79
Lantastic AE-2 Ethernet adapter	199
Lantastic AE-2 MCA Ethernet adapter	275
Lantastic AE-3 Ethernet adapter	235
Lantastic AE-2/T 16bit 10Base-T adapter	210
Lantastic AE-1/T 8bit 10Base-T adapter	135
Lantastic 2Mbps adapter	145
64K RAM upgrade for AE-2, AE-3 adapter	45
Articom (LAN modem sharing software)	269
Lantastic for Netware	269
Lantastic for Windows Network Utilities	165
Central Station Connectivity Processor	405
Peer-Hub 10Base-T concentrator	270
Peer-Hub AUI interface kit	270
Network Eye (Remote Control Access Program)	129
Remote Boot ROM for AE-2, AE-3 adapter	45
Sounding Board adapter kit	72
CASTELLE	
FaxPress (Network Fax Server) Fax from within DOS or Win application, supports PCL,Postscript emultion, supports Novell, MS LAN, IBM LAN (different model)	
Novell 1 line ethernet coax	2595
Novell 2 lines Token Ring 16/4Mbps	3225
JetPress (Network Print Server) for HP II,IID,III,IIID supports thin ethernet and 10BaseT, supports up to 32 queues on up to 8 file servers	429
LANPress (Network Print Server) connects up to 4 printers, supports up to 32 queues on up to 8 file servers	
Ethernet Thick/Thin coax (1P 3S)	489
Ethernet Thick/Thin coax (2P 2S)	625
Ethernet 10BaseT (1P 3S)	489
Ethernet 10BaseT (2S 2P)	639
CC:MAIL	
cc:Mail DOS platform / Windows platform	129/339
cc:Mail 8 user pack / 25 user pack v3.2	129/399
COMPULAN	
8 bit E100 coax	95
16 bit E200 coax	105
16 bit E300 coax dual-port shared memory	129
16 bit E210 combo,BUS mastering,Surface Mount	159
16 bit E650 combo, Surface Mount	149
32 bit E950 combo ethernet	229
32 bit E900 coax	239
16 bit E200/2 coax for MCA	145
16 bit E800/2 coax dual-port shared memory MCA	155
8 bit ET500 TP ethernet	105
16 bit ET600 TP ethernet	125
Boot Prom	25
Pocket adapter for arcnet	135
Pocket adapter for coax / TP ethernet	185
8 port concentrator (10BaseT ethernet)	349
12 port concentrator (10BaseT ethernet)	520
Token ring T1000 16/4Mbps	329
Token ring T1000/2 16/4 Mbps for MCA	349
8-port MAU Type 1 cable, DB9 shielded TP	279
FARALLON	
PN380 PhoneNet card PC for LocalTalk	203
PT100 PhoneNet talk for PC	145
GATEWAY COMMUNICATION	
G/Ethernet 16 coax / 16 TP	159/179
INTEL	
EtherExpress 16	135
EtherExpress 16TP	153
EtherExpress 32 EISA	553
EtherExpress ISA Hub Adapter	585
EtherExpress EISA Hub Adapter	685
NetPort for Ethernet coax / TP	469/479
NetPort for Token Ring	825
NetSatisfaxtion	635
TokenExpress 16/4 for ISA / EISA	535/685
TokenExpress 16/4 for MCA	535
NOVELL	
8 bit NE1000 coax ethernet	145/175
16 bit NE2000 coax ethernet	165
16 bit NE2000TP TP ethernet	185
32 bit NE3200 coax	759
NE10T-Hub 4 Port Concentrator	235

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NE10T-Hub 8 Port Concentrator	369
Netware Lite	69
Netware 2.2	
5 users / 10 users	489/1089
50 users / 100 isers	1925/2955
Netware 3.11	
5 users / 10 users	619/1369
20 users / 50 users	1925/2799
100 users / 250 users	3859/6885

SMC (WESTERN DIGITAL)

8 bit coax Ethercard Plus Elite	139
6 pack	715
16 bit coax Ethernet Plus Elite / 6 pack	162/895
16 bit TP Ethercard Plus Elite 16T / 6 pack	189/975
Ethercard Elite 16 combo (coax/10BaseT)	225
8 Port Concentrator (10 Base T Ethernet)	359

XIRCOM

PE2-10B2 Pocket Adapter Ethernet coax	325
PE2-10BT Pocket Adapter Ethernet 10BaseT	357
PT2-16B3 Pocket Adapter Token Ring 16/4Mbps	615

CABLES & ACCESSORIES

10 BASE-T Twisted pair cable, 1000', PVC	95
10 BASE-T Twisted pair cable, 1000', Aluminum	165
RG58, Aluminum, 1000'	109
Belden 8259, RG58, Aluminum, 1000'	165

18 POWER SUPPLIES

AMERICAN POWER CONVERSION (UPS)

APC-400 Smart-UPS (286, 386 WS)	309
APC-600 Smart-UPS (386, 486 FS)	399
APC-900 Smart-UPS (386, 486, FS and WS)	639
APC-1250 Smart-UPS (multiple FS and WS)	799
APC-450 Back-UPS 286, ps/2, 386	235
APC-600 Back-UPS 286, 386 FS	299
APC-800 Back-UPS 800RT, 2-4ms, 15 mins.	565
APC-750 On-Line UPS (286, 386, 486 FS)	1365
APC-1500 On-Line UPS (multiple servers)	2499
APC PowerChute for Novell	79
APC PowerChute for UNIX	79
Power Doctor (for DOS) I/F kit for Smart-UPS	79

PC POWER COOLING

Standard 220 baby/desktop/tower	119
Silencer 270 desktop/tower	189
Turbo-Cool 300	
slim/baby/desktop/tower	179/179/209/209
Turbo-Cool 450 desktop/tower	379
InnerSource 2210 UPS	
int, 95-132 VAC, 220W DC, 100W AC, equivalent to 550 VA external UPS	389
Novell Netware Interface for InnerSource 2210 UPS	55

OTHERS

150W / 200W (XT) (UL)	40/48
200W / 230W for Baby AT & Baby,Mid Tower	45/55
230W for AT	48
230W for FullTower	59
500W for Full Tower	99
550W (UPS)	279
1200W (UPS)	999

19 PRINTERS

CANON

BJ-10ex (Bubble jet)360 dpi,37K buf	$319
Auto Sheet Feeder	79
Bag / Battery	39/45
Print Head Cartridge	22

CITIZEN

GSX 200 (9 pin)	165
GSX 130	229
GSX 140 Plus (24 pin)	289
Color Option for above printers	45
Auto Sheet Feeder for GSX 140	109
GSX 145 (24 pin, 132 column)	379
Color option for GSX 145	65
PN48 notebook printer,1ppm,2lb,battery,case	339

FUJITSU

DL1100 mono	295

HEWLETT PACKARD (LaserJet w/ toner)

Desk Jet 500	395
Desk Jet 500C	679
Jet Ram Memory 256K	69
Laser Jet IIP+	775
Laser Jet III	1445
Laser Jet IIIP / IIID / IIISi	995/2395/3495
Accessories:	
Envelope Tray(15 envelopes) for III	69
Envelope Tray for IIP,IIIP	79
Envelope Feeder for IIID	295
HP Postscript Cartridge for IIP, IIP+, III, IIID	395
Legal Tray for HP II, III	69
Lower Cassette (w/ letter tray) IIP,IIIP	160
Toner for HP II, III	85
Toner for HP IIP, IIP+, IIIP	75
Jet Ram Memory for HP II	
2MB / 4MB	135/205
Jet Ram Memory for HP IIP, IIP+,III,IIIP,IIID	
1MB / 2MB	75/115
3MB / 4MB	155/195

MICROTEK

TrueLaser 6ppm,2MB,35 fonts	1355

PACIFIC DATA PRODUCTS

ProTracer inkjet printer/plotter, A- to C-size output 360dpi, I960RISC processor, 512K, 45dBA	call

PANASONIC

1180i / 1123	158/199
1124i / 1624 / 1695	285/355/359
Auto sheet feeder for 1124 only KX-P36	120
2123 24 pin, 43.5dBA, color capability	249
2124i 24 pin, 43.5dBA, color capability	319
2180 9 pin, 45dBA, color capability	175
Color upgrade kit KX-PCK11	49
Single bin cut sheet feeder KX-PT10	95
2624 (24 pin, quiet printer 46.5 dBA)	385
32K Buffer for all dot matrix printers KX-P43	65
Serial interface card KX-P19	75
4410 Laser, 512K 5ppm	645
1MB mother Ram board KX-P444	169
1MB daughter Ram board KX-P445	135
LaserBoard 1MB (3rd party)	149
Corona KX-PCR3	45
Developer KX-PDP4	105
Drum KX-PDM4	89
Extra Cassette KX-PKC2	45
Fonts Card KX-P47x	95
Fuser Unit KX-PFS5	105
Optional Second Cassette KX-P495	135
Toner KX-P453	35
4420 Accessories	
RamBoard 1MB / 2MB / 4MB	99/139/219
Developer KX-PDP2	95
Drum KX-PDM2	99
Envelope Tray KX-P431	59
Fonts Card	95
Legal Tray KX-P425	45
Ozone Filter KX-PFT2	26
Toner KX-P451	39
4430 Laser, 1MB, 5ppm	895
4450 Accessories	
RamBoard 1MB	139
others same as 4450i	
4450i Laser, 11ppm	1055
RamBoard 1MB / 2MB / 4MB	99/139/219
Developer KX-PDP1	95
Drum KX-PDM1	145
Envelope Tray KX-P430	59
Fonts Card	95
Legal Tray KX-P420	45
Ozone Filter KX-PFT1	29
Toner KX-P450	35
4455 (Postscript) 11ppm	1715
RamBoard 1MB	159
others same as 4450i	

QMS (Adobe Postscript)

QMS-PS 410 4ppm, 2MB, 45 Fonts	1395
1MB / 2MB / 4MB Memory	125/165/245
Envelope / Legal / Letter Tray	69/69/69
Lower Cassette with Letter Tray	160
Toner	95

SEIKO

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RamBoard 1MB	69

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TTI 3000C 300dpi	$1095
TTI 6000C 600dpi	1295
TTI 8000C 800dpi	1595
Slide Scan Kit (for transparency,slide,X-ray)	695
Hand scanners	see Logitech in section #17

21 TAPE BACKUP

COLORADO

DJ-10 (120MB) QIC-40 w/ cable	$195
DJ-20 (250MB) QIC-80 w/ cable	265
AB-11 External tape port	45
Cable (2 Floppies & tape back up)	9
FC-10 Controller	95
KE-09 Ext kit w/o controller	75
TC-15 controller w/ data compression	195
Unix/Xenix driver for DJ-10, 20	129
QFA-700 (700MB)	745
TC-02 adapter (required)	259

EVEREX

EV-811 8 bit adapter QIC-02 for XT,AT	105
EV-880 floppy tape adapter for AT	65

IRWIN

ARC 120MB	189
ARC 250MB	255

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120MB / 250MB External (printer port)	365/425

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FS2100 2.2GB, 8mm, w/ SCSI cont, ext	4895
FS7250 150-250MB, QIC-02, w/ cont, ext	1435
FS7250 250MB, w/ SCSI cont, ext	1565

SUMMIT

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SE250 250MB w/ Central Point Back up	275

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DC 6250 (250MB)	26.95
DC 6525 (525MB)	39.50

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All cards 1024x768 except as stated

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Oak067 Super VGA 512K	55
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VRAM (1MB DRAM)	285

GENOA

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7900 Multimedia VGA	
1MB, Hi-color, 16 million color, 24 bit	175
8800 1MB 1280x0124	235
8860 1MB 1280x1024 Hi-color	255

HERCULES Graphics Station 1MB	495

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16 colors at 72Hz, 1MB VRAM	939
GXI Level 23 for CAD 1280x1024	
16 colors at 72Hz, 1MB VRAM 1MB DRAM	1225
GXI Level 24 for Windows 1280x1024	
256 colors at 72Hz, 2MB VRAM	1299
GXI Level 25 for Windows 1280x1024	
256 colors at 72Hz, 2MB VRAM 1MB DRAM	1445

ORCHID

Fahrenheit 1280 1MB with Hi-color,1280x1024	255
Fahrenheit 1280-D 1MB with Hi-color,1280x1024	255
ProDesigner IIs 1MB with Hi-color	169
ProDesigner IIs-D 1MB with Hi-color	199
ProDesigner IIs, 1MB, Hi-color for MCA	399

UNITED SOLUTIONS

Image 800x600 16bit w/256K	55
Ultra 1MB 1280x1024 Hi-color	159

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VRAM II 1MB	329

III SOFTWARE

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Type Cartridge 2: Best Sellers	99
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Type Align for Windows	63
Type Manager for Windows	59
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Type Set: Overheads & Slides	87
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IBM

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DOS 5.0 w/ Windows 3.0	89
Entertainment Pack for Windows I / II / III	28
Excel 4.0 for Windows	299
Excel 4.0 for Win Upgrade	97
Excel 4.0 for Win Competitive Upgrade	125
Flight Simulator	39
Joystick Warrior 5	14.50
Maxx II Control Yoke for PC	49
Maxx Pedals for PC	39
Microsoft C/C++ 7.0 w/ SDK	305
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Money for Windows	49
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Publisher for Windows	125
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Visual Basic for Windows	125
Visual Basic Pro Tool Kit	call
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Windows 3.1 Upgrade	47
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Word for Windows upgrade to v2.0	125
Works for DOS / Windows	95/125

SANTA CRUZ OPERATIONS (SCO)

SCO C++	915
SCO ODT Personal System 1.1	1170
SCO ODT Personal System 1.1.1 (tape)	1086
SCO Multiview 386 1.6.1	299
SCO XENIX-NET 386 single server v1.3.0	685
UNIX 386 Dev Sys 3.2.2 C-Compiler & Dev Tools	995
UNIX 386 GT Oper Sys 3.2.2 Multiuser	995
XENIX 386 Dev Sys 2.3.1 C-Compiler& Dev Tools.	610
XENIX 386 GT Oper Sys 2.3.4	585

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After Dark for Windows (screen saver)	29
Aldus Freehand 3.0 for Windows	379
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Persuasion 2.1 for Windows	325
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Alpha Four 2.0	295
Automap (road atlas)	46
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Carbon Copy for Windows	112
cc:Mail Windows platform pack	339
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Claris Hollywood for Windows	312
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Fastback Plus 3.04/for Win	117/117
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Fax Pak :WinFax Pro,Fax Grabbler,Norton Desktop	145
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hDC Windows Express	55
Hardvard Graphics 3.0 for Windows	375
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Intermission for Win (screen saver)	29
LapLink Pro v4	89
Lotus 1-2-3 for Windows	389
1-2-3 Rel 2.3 for DOS	315
1-2-3 Rel 3.1+ for DOS	379
Ami Pro for Windows	279
MacPrint	85
MicroGrafx Designer 3.1	355
More Fonts / Display Faces	77/77
Norton Desktop 2.0 for Windows	99
Norton Utilities 6.01	112
PC Anywhere 4.5 Remote and Host	115
PFS: First Choice (w/ Prodigy start-up kit)	79
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Procomm Plus 2.0	69
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DesqView 286	79
DesqView 386 v2.4	125
Qemm 386 v6.0	62
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Quicken for DOS/ Mac/ Windows	49/49/39
QuickBook	87
QuickBook & QuickPay	110
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Speedstor 6.5	61
Speedstor Plus w/ SCSI controller	75
SpinRite II	60
Stacker Data Compression 2.0	83
Stacker AT/16	179
Superstor	79
The Far Side (computer calendar)	45
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Winfax Pro	72
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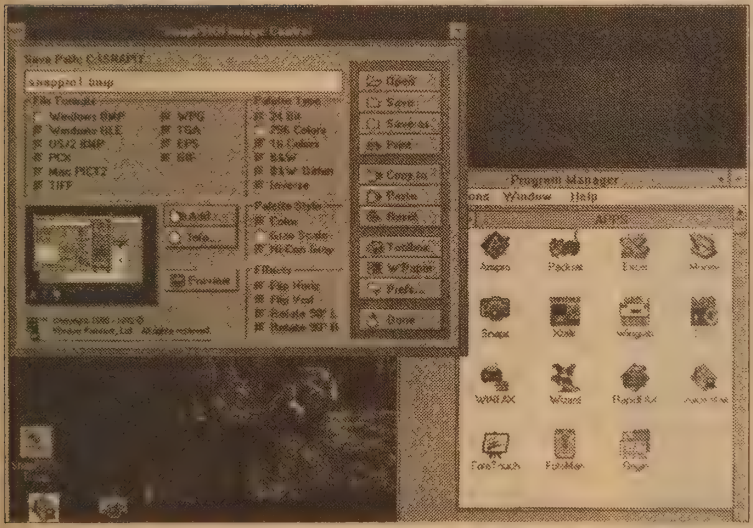
Educational / games	visit us

When a program is changed as radically as Signature, however, something is bound to be lost. In this case it is speed. XyWrite had the advantage of blazing speed for entering and editing data, a characteristic which endeared it to journalists. Once you learned its commands, it never got in your way. Signature, by comparison, seems annoyingly slow on my vintage 286. The screen doesn't keep up with the keyboard, the program takes forever to load, and menu navigating requires many disk accesses. A fast processor or a RAM disk would of course help. XyQuest recognizes the problem and promises increased speed in future revisions. They are also preparing a Windows version with a fast editing mode. (XyQuest, Inc., 44 Manning Rd, Billerica, MA 01821. 508/671-0888)

SNAPPRO

Published By: Window Painters
List Price: $69.95
Reviewed By: Woody Liswood

SnapPro adds a camera icon to your Windows desktop. When activated, it takes a picture of your Windows screen. You can then manipulate and save that image to a variety of formats. To keep things interesting, SnapPro lets you take those same images, combine them, change formats, or save them to the clipboard so you can put them wherever you want.



SnapPro can automatically capture the full screen, the active Window, the Client area, or a defined capture. Other options include showing the screen coordinates, warning when you are about to overwrite a file, and to incrementally name the files.

The palette types and styles give you great flexibility. When a captured image arrives into SnapPro, it is in the format you were working with when you took the picture. For example, if you were running a 256-color driver, SnapPro captures in a 256-color palette. You can change to other types just by clicking the correct button and then save the image in the new format.

With Image Builder, SnapPro's toolbox, you can perform a variety of manipulation tasks such as duplicate the image; bring an image to the front; send it to the back; rotate it in any direction; make it transparent or opaque; create mirror images; and copy, save, print, or transfer to or copy from the Windows Clipboard.

Lastly, if you also live in DOS, you get a DOS-based TSR so that you can capture and save images from DOS programs, which you can then manipulate and change under Windows.

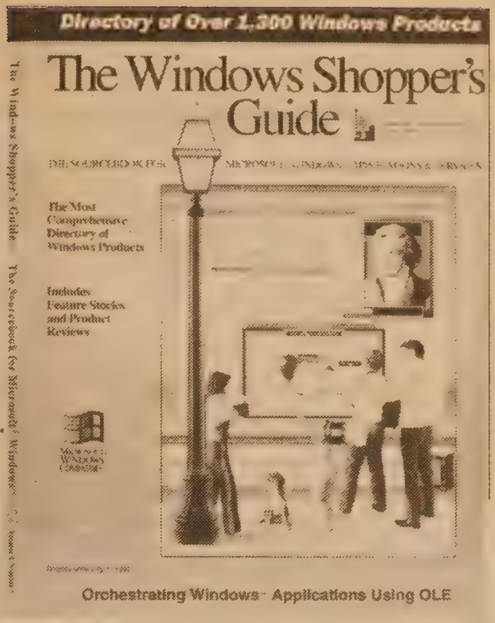
The only drawback I could find with SnapPro is that it does not install through the Windows Run Command. You must create a directory at the DOS level, copy the SnapPro files into it, and then use the File New command to add the icon to your program group. After that, SnapPro is a snap to use.

SnapPro is one of those types of programs which probably are not in use on an everyday basis, but when you need them, they become instantly indispensable to your productivity. With the wide variety of supported formats and the extreme ease of use, SnapPro will earn a permanent place in your collection of absolutely necessary specialty programs. (Window Painters, Ltd., 7275 Bush Lake Rd., Minneapolis, MN 55439-9541. 612/897-1305)

BOOK REVIEW

WINDOWS 3.1 COMPANION

Published By: Microsoft Press
Written By: Lori L. Lorenz, R. Michael O'Mara, and Russell Borland
List Price: $27.95
Reviewed By: Woody Liswood


Directory of Over 1,300 Windows Products
The Windows Shopper's Guide
The Most Comprehensive Directory of Windows Products
Includes Feature Stories and Product Reviews
Orchestrating Windows Applications Using OLE

I am firmly convinced that the large number of books on the market about the major programs are there to provide documentation for all the people who are using copies of copyrighted programs. In fact, Microsoft even publishes some of these books. I suspect they feel that even if they are being ripped off, selling books about the program provides some revenue.

If this is the case, the *Windows 3.1 Companion* does a great job of providing all the information you need to install and run Windows 3.1. It is written in a lighter, more readable style than the official 3.1 documentation, including different illustrations and a four-color section discussing "Windows in Color." On the other hand, the information in this book is also available in the legitimate documentation.

I did not compare, word-for-word which is more complete. I'm certain, given the size of the book, there must be some things here that are not in the documentation.

If you already own Windows you might prefer the writing style of this book better than the original documentation. If you use Windows microapps (also called accessories), you will probably more easily learn about using them from this book than from the Windows documentation.

This is a well-written, intelligent, straightforward explanation of Windows 3.1: what it does, what it comes with, and how to use these features. (Microsoft Press, One Microsoft Way, Redmond, WA 98052-9953. 1-800-MSPRESS) ■

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WIN47 Iconmaster 1.1 for WIN 3.1
ED36 Computer guide to Solar System
GE4 Brothers Keeper 5.0 (3) Best Geneology
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U75 Microsoft Diagnostics
WIN 29 PaintShop Pro 1.0-View, Alter, Capture
E41 Word for Windows 2 Power Pack (2)
E1 PC Write Standard Level 2 (4 Disks)
WIN 69 Chartist-flow and OR6 Charts
WIN65 Winclick 3.0 & Winpost it 3.0
WIN73 Sound Blaster Pro Drivers for WIN 3.1
WIN52 GO - OCR - For Windows Supports Hand Scanners
U76 PK-Lite 1.12 for DOS 5
VP1 (2)Scan 89 & Clean 89
WIN79 Wynbase Relational Database
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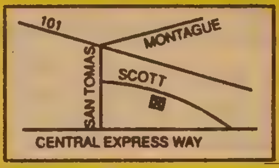

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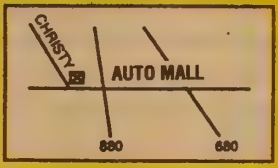

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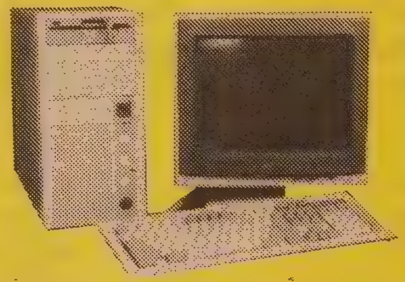

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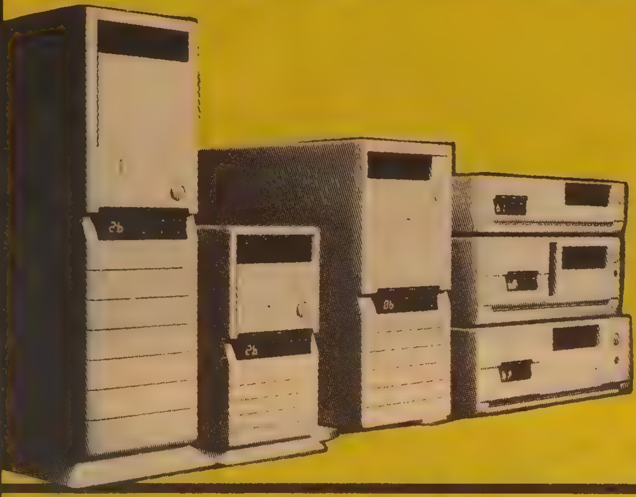

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CREATIVE TOOLS

OFOTO The Natural Look In Scanned Photos

You Don't Have To Settle For "Computerized" Images Any More

BY TONY REVEAUX

Light Source's Ofoto scanning software is able to interpolate images scanned from photographs and deliver black-and-white hardcopy prints showing the credibly smooth tonal ranges that we associate with photography. Ofoto introduces a basic user level that offers point-and-shoot simplicity, eliminating the need of the usual trial-and-error process of multiple passes. Instead of what we've come to expect from digitized images, with their characteristic "computerized" stylized look, Ofoto scans look like "normal" photographic images.

"WORTH A THOUSAND WORDS"

The Ofoto package includes a copy of Rick Smolan's 68-page book Worth a Thousand Words: Scanning for the Real World. Smolan, author of projects such as *A Day in the Life of California,* is one of the founders of Light Source and the Ofoto system.

The book reflects the esthetic integrity of the well-laid-out documentation and theOfoto product itself, providing a collection of case studies of the variety of ways in which photographic images used in desktop applications can be valuable enhancements. You can drop a photo in a letter, fax, proposal, mock-up, comp, newsletter, real estate listing, sales flyer, brochure, instructional manual, term paper, inventory, or personnel file. Often this is a far more effective method than text for conveying information.

EASY SCANS

Ofoto automates the scanning experience in a similar manner to that of a point-and-shoot, auto-focus auto-exposure camera. The scanning algorithms of Ofoto interpolate the reading; that is, mathematical formulas in the programming interpret and sort out the combinations of light and dark reflections that the scanner perceives.

Other scanning programs offer you parameters to set, then require you to go through much trial and error, usually many prescans and resettings until it looks good. Ofoto has controls like these too, where you can adjust threshold, contrast and brightness, and bit-depth for line art, though it doesn't have a gamma control or the ability to spec out highlight areas. However, when you select the Autoscan command, Ofoto automates most of these concerns. It "looks at" the image through the scanner, and determines if it is line art or a photo, and what internal settings to use. It's as if your car had not only cruise control, but radio-controlled steering as well.

The result is a smooth image that is usually right on the money the very first time. The more demanding your professional needs, the more likely it is that you'll need to move that Ofoto scan into an image retouching program like Adobe Photoshop or Silicon Beach's Digital Darkroom.

On the right side of each scan, Ofoto. On the left, Microtek Black and White.

I use Ofoto through a Microtek 600ZS scanner on a Macintosh IIcx with 8MB. The Microtek Black & White DA scanning software bundled with the machine is a high quality application, and a good benchmark for scans. I still use it for line art because of its handiness and speed. But Ofoto is the only program (thus far) that has those magic algorithms.

I had a request from a San Francisco theater company to scan some 1940s *film noir*

RESOURCES:

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Tony Reveaux, a San Francisco-based consultant, is the editor of Computer Publicity News *and a contributing editor for* Artweek, *and writes the "MediaScan" column in* Film/TapeWorld. *He can be reached via Usenet (luna@well.sf.ca.us) or MCIMail 290-3008.*

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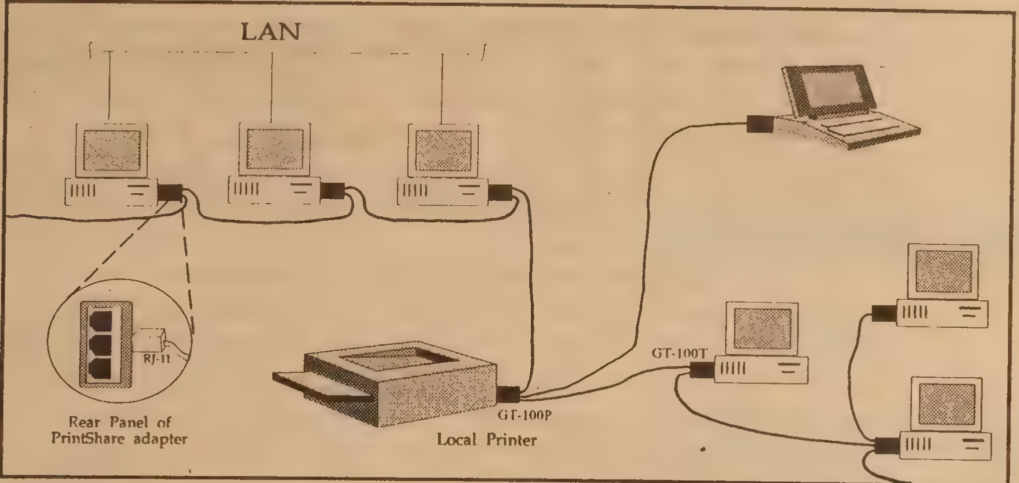

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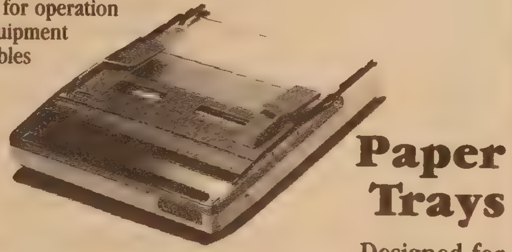

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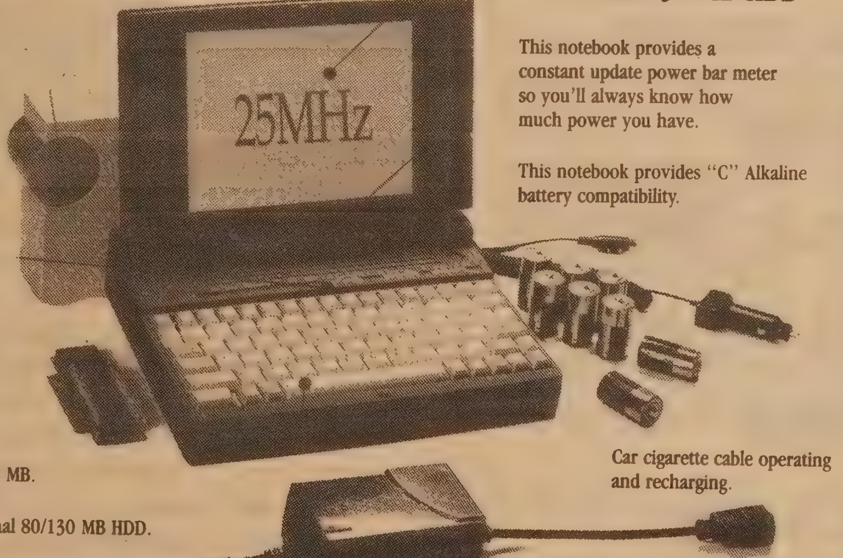

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movie stills from a book to make quick slides for a performance. Under these conditions, you get moire patterns on the scans of halftone prints; these can be eliminated when you go to make next-generation prints by setting the halftone controls. If I'd had Ofoto, which subdues the moires, then we could have gone from disk files directly to slides using a film recorder at a service bureau, with the benefits of speed and economy.

Ofoto's desktop scanning controls include many refinements that make the scanning experience even easier. No matter how often you use a scanner, there will always be those times when you place the original on the platen and discover in the prescan that it is crooked and out of alignment. Ofoto has an autostraighten function with its Straighten tool. It is like a rotation tool (and performs that function also) but with a grid structure, allowing you to reorient the image in the software. Its tool palette also includes a zoom control, as well as a pencil, eraser, lasso, and a selection rectangle to restructure your image internally beyond cropping. It has onboard LZW compression for saving files in TIFF, and it has Apple's extension to the PICT file format for use with its QuickTime Image Compression Manager. You can also select MacPaint and EPS file formats.

> **Ofoto's Autoscan function "looks at" the image through the scanner, then determines if it is line art or a photo, and what internal settings to use. It's as if your car had not only cruise control, but radio-controlled steering as well.**

GREAT PRINTS

As desktop digital imagery has matured, it has begun to catch up with the closed system technology of professional commercial printing houses. From the photography of the original negative to the plates, press, and paper, professional printers exercise rigorous measurement and control of the process from the very beginning to the final binding. With the display- and output-matching color calibrators offered by RasterOps and SuperMac, and Savitar's ScanMatch software program, our control of the finishing stages of digital imagery on the desktop has become much more effective.

A core strength of Ofoto is not only its smoothly automated scanning interpolation algorithms, but its ability to smooth-talk the printer. The Adaptive Calibration Gray Chart is built into the program. Like everything else from Light Source, this advanced feature—which can be so, so tricky—is completely automated here. It gives you the power to customize settings for as many different output printing devices as you're likely to use. You may want to have one setting for a creaky ImageWriter at the office that you use for rough copy proofs, another for the LaserWriter IIg at your favorite service bureau, and yet another for the Linotronic 300 at your publisher's volume printer.

You create the gray chart beginning with selecting the printer type. The menu of supported printers is extensive and even includes fax modems. The New Printer dialog box allows you to enter the dpi (or lpc, lines-per-centimeter) and PostScript compatibility information under its name, and the device will be added to the menu. If the printer is connected to your computer, you can print the chart directly. If the printer is located elsewhere, you can save the chart as a document to disk. Take the disk to the site and make a print of the chart. Return the print of the gray chart to your scanner, and scan it into Ofoto. There, the new calibration is saved as a menu selection for a save and/or print command. You may want to fine-tune things even further, by having one calibration version denoted for documents printed from say, PageMaker, and another for Photoshop.

As good as a one-off scan and print from the Auto setting of Ofoto is compared to other scanning programs, it really does make a difference if your document is calibrated for the designated printer. As a test, I chose a still of Charlie Chaplin in *Modern Times* for the wide tonal stretch between the light foreground ranges in the facial modeling against the layers of dark background elements. While the uncorrected print seemed acceptable at first blush—we've become accustomed to this quality—the calibrated, tone-corrected print was dramatically better. The first thing that stood out was the revelation of detail in the background that had been darkened over in the first print. Charlie's facial detail displayed a smooth, continuous tone without the "clowning" patterns of contrast discontinuities.

While Ofoto will liberate your communications from the jaggies and crunchies of obvious digitization, you shouldn't expect the image that comes out of your LaserWriter to *be* a photograph. Ofoto goes the distance, but it doesn't go that far. Also, the paper is different. Most photo halftones are printed on coated or semi-coated stock. A coating slip made from china clay and other stabilizers and adhesives gives it a fine finish that allows the ink to sit on top of it and stay—as in the *Worth A Thousand Words* book. Normal, uncoated printer paper keeps the ink on by letting some of it soak into the pores and fibers of the stock, with inevitable dispersion.

However, Ofoto offers significant advantage in that it enables the average user to include halftones in documents where, before, they may have been considered too crude.

The Windows version of Ofoto has just shipped (both Mac and Windows versions are $395), and a version for color scanning is due in the fall. Judging from what Light Source has done for the grayscale world, it will be very interesting to see how well they can automate the three-times-harder color scan. With the continuing affordability of color scanners and printers, there should be a lot of colorful Ofoto opportunities out there. ■

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The Raines Road Show, And Other Spring Follies

BY DAVID MORGENSTERN

BMUG

What a month to be a BMUG member! Raines Cohen, one of BMUG's founders and board members, is off on his honeymoon. A trip to Hawaii, or Lost Wages, Nevada, might suffice for the rest of us, but not for a BMUG ambassador and bicycle fanatic. The honeymoon will consist of Raines bicycling 3000 miles across the continent. He will pedal his way into the BMUG booth at the Boston Macworld Expo in August. This colossal effort is being called the BMUG Tour: Raines on the Road.

Somehow Raines was able to persuade Kandy Arnold, his bride-to-be, that they'd have a terrific time dropping in on over a dozen user groups as they go from town to town. He must be the first person to successfully use the old "we can go to Europe any old time" line. She'll be pacing Raines in the tour support van, filled with old BMUG newsletters and tie-dyed T-shirts—gifts for the natives. Kandy is an excellent writer, so perhaps she's hoping to place the story in the ride-and-tell tabloids.

Raines is mounting the BMUG video camera to the nose of his bicycle. Portions of the trip will be digitized and featured in a later volume of our QuickTime CD-ROM series, the TV-ROM. We'll also be receiving on-the-road phone reports at the weekly BMUG meeting.

Copyright © 1992 by David Morgenstern. All rights reserved. David Morgenstern believes that computers and BMUG can cultivate a positive change in the world. He volunteers time at BMUG, when he's not working his "regular job," writing, or prowling around the BMUG Bulletin Board. He can be reached through the BMUG office, AOL: daviD eM, CIS: 72030,1607, and Internet: davidm@sfsuvax1.sfsu.edu.

SOLID FOOL'S GOLD

Back in April, I called up Steve Costa, BMUG director, with some real hot news. PowerBook batteries were starting barbecues, with their owners as menu items. It seemed that some user's batteries had been floating loose in a backpack, and some metal object had crossed the exposed terminals. Apple said keys or paper clips could cause the problem, resulting in a smoldering fire, or at least a hot spot!

Steve's take on this information was that it was a typical Silicon Valley hacker April Fool's joke. He swore that he had personally tested this by holding a paper clip on the terminals, and had not seen any smoke signals. I couldn't find a braces-wearing volunteer to step forward and test the rumor at a BMUG meeting.

Wouldn't you know that the story would turn out to be true!

Apple announced that it is offering free protective cases for the replaceable battery packs. After May 1992, all Apple PowerBook rechargeable batteries will be sold with the case included. It's also comforting to know that you'll never have to rub twigs together if you're lost in the woods.

After May 1992, all Apple PowerBook rechargeable batteries will be sold with the case included. It's also comforting to know that you'll never have to rub twigs together if you're lost in the woods.

There was honest April Fool's fun down at Apple headquarters. When walking into an elevator, people were greeted by a sign pointing to a microphone, requesting them to state the floor they wished to go to. Everyone thought that someone was listening to their requests and then controlling the elevator. They got part of it right. The "person" listening to the numbers was a Macintosh computer! Oscar, Apple's voice recognition software was on the other end of the microphone. Going up.

TRIVIA THE TATTOOED LADY

As promised last month, the Second Annual MacTrivia Test (Part Two). This is the hard part of the quiz, so don't let your score disturb your self-esteem. The test covers general computer knowledge, as well as the Mac-specific. Anyone with a perfect score—Get a life!

ORIGINS OF THE SPECIES

1. The first computers were

a) incredibly complicated mechanical devices.
b) filled with thousands of vacuum tubes.
c) people that counted on their fingers and toes.

2. Which of the following are actual error messages from programs?

a) Sorry, I don't know how to help in this situation. Maybe you hould try asking a human?
b) You can't do that in horizon tal mode.
c) An error has occurred on the error logging device.
d) All of the above.

3. In 1947, the leading experts predicted that no computer would ever need more than

a) 20K of memory.
b) 200K of memory.
c) 20,000 vacuum tubes.

4. The word *Kludge* means

a) computer sludge.
b) mid-level bureaucrat in the Ku Klux Klan.
c) a clever piece of programming.

IN YOUR INTERFACE

5. There are three classes of alert boxes on the Macintosh. They are

a) Sloth, Envy, and Gluttony.
b) Stop, Look, and Listen.
c) Note, Caution, and Stop.

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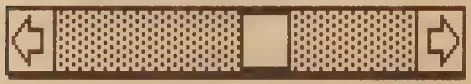
6. If you see a folder called Rescued Item from... in your System Folder, you have

a) crashed.
b) undergone a religious experience.
c) stepped over into theTwilight Zone.

7. Scroll bars are used to change the part of a document shown on the screen. They consist of two scroll arrows on either end and a scroll box that slides along a long, gray rectangle. What is the gray part called?



a) The Dead C++ Scrolls.
b) The scroll path.
c) The gray area.

8. The Apple Desktop Bus (ADB) is the usual way to input into a Macintosh. How many ADBs does a standard Macintosh computer have?

a) One.
b) Two.
c) Sixteen.

9. What is the origin for the Command key (that's the one with the Apple and the four interconnected loops)?

VIRUS DETECTION

10. The Peace virus made Macintosh and computer history by

a) being the first Macintosh virus.
b) being the first virus shipped in commercial software.
c) being the first virus whose programming was contracted out by he virus developer.
d) all of the above.

11. The very first computer virus was

a) the head cold suffered by Ada Byron, the world's first programmer.
b) "created" by bookworms eating through stacks of keypunch cards.
c) something that infected the military computer networks.

12. A metavirus is

a) a supervirus that can infect any system regardless of maker.
b) a pantomime virus.
c) the product of metaprogramming techniques.

ANSWERS—NO CHEATING!

1. c) The word "computer" comes from a class of human workers: Computers. It's ironic that the first group of workers displaced by the computer were computers, people that counted things for a living. They would grind out the calculations needed with brain power, assisted by fingers, toes, pencil, and paper.

2. d) Programmers have a lot of fun with funny error messages. The best ones were from the 1970s, when the audience was predominantly other programmers. Many of the messages had an existential twist, like the networking "Go away. You don't exist." Most commercial software for personal computers has been sanitized, but that doesn't stop "Keyboard not present, Press any key" nonsense from occasionally sneaking through.

3. a) It's difficult for us to believe that computer scientists could actually believe that any problem could be solved in 20K of memory—especially when new Macintosh machines will ship with 4MB standard. Even the smartest technoid can underestimate the ever expanding need for more RAM and storage.

I remember an early BMUG meeting where Reese Jones (BMUG's first president, now chairman of Farallon) claimed that anyone who needed more than a 20MB hard drive was pirating too much software. All computer predictions must be taken in their operational context. That was a time when an application and a system could fit on a 400K floppy disk.

4. c) The word is supposedly from the German word *kluge,* meaning clever or cunning. It has the sense of being a bug repair that somehow works, but is not something to hang on the wall. It's pronounced like the word *clue.*

5 c) Note, Caution, and Stop are each used for different kinds of situations, and have different icons. Note gives information about situations that have no drastic consequences. The usual response is hitting an OK button. Caution calls attention to operations that may give you grief if you continue. The default is often set to cancel. Stop calls attention to some serious problem that requires a user decision

6. a) One of the new additions to the System folder in System 7 is the Rescued Item folder. When you use applications on your Mac, temporary files are often created. These are stored in an invisible folder called Temporary Items. If you crash, the files in the Temporary Items folder are supposed to be moved over to the Rescued Items folder. Of course ,you have to know to look for the folder and the files...

7. c) I know it's hard to believe that such a logical device as a Macintosh could have a gray area (grey in the UK). For you know-it-all programmers that don't believe that this is correct—look in the Human Interface Guidelines!

8. a) What a trick question! Although there are a couple of ADB *ports* on the back of the computer, there's only one bus. Although the bus specification says it can support sixteen devices, you shouldn't chain more than three devices on each of the ports.

9. The symbol is called "fornminne" in Swedish, translated to "things to remember, of old age." It is also the Cross of Saint Hans. In the Nordic countries it's used to mark old ruins, Viking graveyards, and other sites of cultural and historical value.

Cross of Saint Hans. In the Nordic countries it's used to mark old ruins, Viking graveyards, and other sites of cultural and historical value.

10. d) Can you believe it? This is one of the strangest stories in virus history. Richard Brandow, publisher of the Canadian Macintosh magazine, *MacMag,* decided to spread a "universal message of peace." The vehicle for this message was a computer virus. On March 2, 1988 (the first anniversary of the introduction of the Mac II and SE models), thousands of Macs had the message for peace displayed on their monitors. The virus had the good sense to then delete itself.

Brandow hired a young programmer from Arizona, Drew Davidson, to write the virus. The kid thought the idea was "neat." Since this was the first Mac-based virus, there was no stopping the thing. It even showed up in shipping copies of Marc Canter's tutorial demo for the graphic program, Aldus FreeHand.

Like many nuisance virus attacks today, the Peace virus did not intend to cause harm, but may have interfered with some other normal process happening at the time of infection, or message display. At the time, a Seattle district attorney issued extradition orders, and a warrant, subject to arrest upon entry to the US, for Brandow.

11. c) The Creeper infected the military/educational/corporate network called ARPAnet in 1970. It left a message, "I'm the Creeper, catch me if you can!"

It was a demonstration program that "got out of control." This is the first use of the out-of-control excuse that seems to be the first words out of virus authors when they're caught nowadays. The Creeper was followed by the Reaper virus, that looked for the Creeper and

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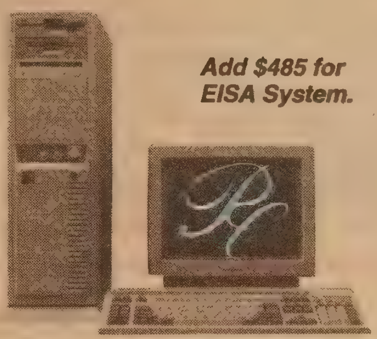

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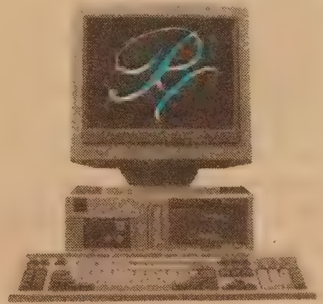

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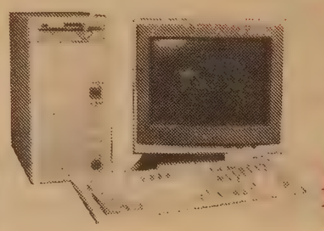

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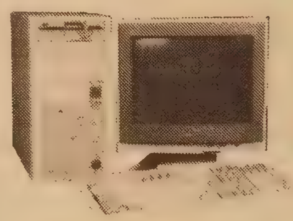

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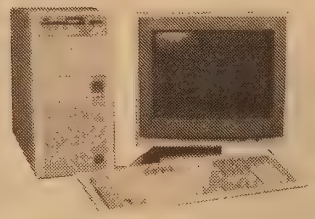

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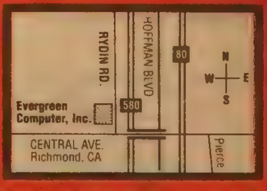

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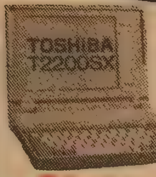

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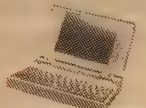

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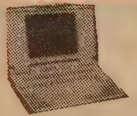

WINSX standard features include: 80387 3X/20 co-processor, sidelit back or white triple supertwist VGA LCD screen with a resolution of 640x480 322 grey scale, 3.5" 1.44MB floppy drive, MS-DOS, Windows, Battery Pro, Laptop File Manager, Poser Save, Password, Utilities, battery and AC adapter

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ESDI 1:1 HD/FD cont ultrastore w/32K	179
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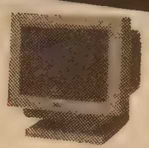

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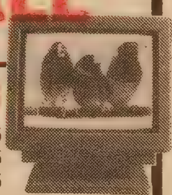

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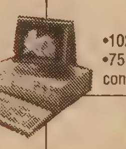

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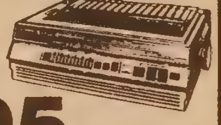

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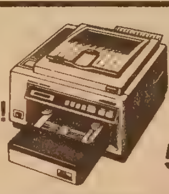

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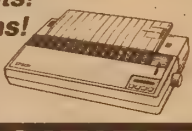

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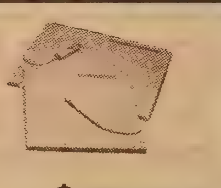

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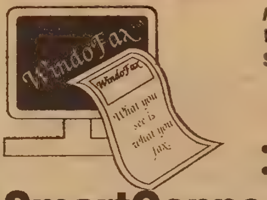
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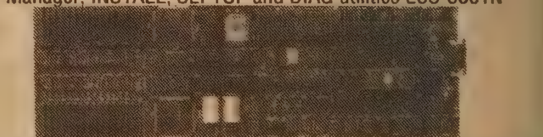

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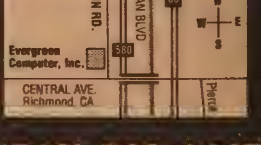

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removed it.

12. b) In 1988, a message was posted on the Internet that warned that a virus was hidden in a tax template. This was the message:

> "*Warning!* A serious virus is on the loose. It was hidden in the program called 1988 Taxform that was on this bulletin board last year... By now it is possible that your system is infected even if you didn't download this program, since you could have been infected indirectly.
>
> "The only way to protect yourself is to print all your files onto paper, erase all the disks on your system, buy fresh software disks from the manufacturer, and type in all your data again.
>
> 'But *first*, send this message to everyone you know, so that they will protect themselves."

This is a sympathetic hypochondriacal computer virus, the perfect union of man and machine. If you tell people in the ballpark that the hot dogs were off, a certain percentage react with the symptoms of food poisoning. Whenever anyone has the slightest problem with their computer, the first thing they think of is a software virus. ■

UPCOMING EVENTS:

June 4	Hewlett-Packard—scanners; Microsoft—Excel 4.0.
June 11	Interactive Solutions—MovieWorks; PIM, Inc. Info-Mation.
June 18	Aldus—Aldus Editions; Equilibrium—Rotate That (PageMaker Add-Ons).
June 25	Human Wave—Technology Monopoly; Spectrum Holobyte—Falcon 25.
June 29	BMUG West at Exploratorium museum in San Francisco. Aladdin —StuffIt Deluxe 3.0; Relysis—Tefax RA2125 (combo fax/scanner).
July 2	Articulate Systems—Voice Navigator software.
July 9	Knowledge Revolution—Interactive Physics II; Silicon Beach Software—New Product.

Call Betsy Kennedy at the BMUG office about our new Windows Special Interest Group and Windows Newsletter! The BMUG Announcement Line has the latest information on BMUG activities: (510)849-9114.

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BMUG is an educational, nonprofit, consumer advocacy group organized to share information and provide critical direction to users and developers in the computer community worldwide. It is an independent advocate, not affiliated with any manufacturer, delivering trustworthy information and useful products.

Like any growing organization, it is many different things to its thirteen thousand international members. BMUG supports many Special Interest Groups (SIGs), a Bulletin Board System (BBS), free HelpLine, software library, weekly meetings, publications, and much more. BMUG also puts out a semi-annual 400+ page book that we call our "newsletter."

Our motto continues to be: We're in the business of giving away information.

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6–9 pm (or whenever we finish), in the Physical Sciences Lecture Hall on the UC campus. BMUG West is a meeting held monthly in the Exploratorium, San Francisco's science museum.

The BMUG Office, 2055 Center St. (a half block from the BART station) is open to the public from 9 am to 5 pm. Please come by and say hello, meet other members, and hang out.

The BMUG HelpLine, (510)540-1742, and our fax number, (510)849-9026, provide technical assistance and telephonic hand-holding during business hours (11 am–5 pm.). If your question can't be answered on the spot, we try to get you in touch with someone who can help. Of course, not every problem can have a happy ending—but we try.

BMUG has one of the most up-to-date, comprehensive software libraries around with hundreds of disks filled with the latest versions of public domain or shareware programs, and HyperCard stacks. New disks are unveiled almost every week at the Thursday general meeting. BMUG also brings you the TV-ROM™, a fantastic collection of public domain QuickTime videos.

Our sixteen-line BBS offers many of the latest versions of files in our software library as well as news, private mail, rumors, etc. The BMUG BBS is part of the worldwide EchoMac Network on FIDOnet (161/444); by calling a local FIDOnet BBS in your area, you would be able to get in touch with us wherever you are, as well as send mail to users everywhere! With our multiline capability, you can have access to BMUG almost twenty-four hours a day. It's easy to use, fun, and a great resource.

BMUG can be found on most electronic services. BMUG can also be reached through the international USENET network through bmug@garnet.berkeley.edu.

To get some further information about BMUG please write to: BMUG, 1442A Walnut St., #62, Berkeley, CA 94709. If you prefer to phone our business office call (510)549-BMUG, or fax(510)849-9026.

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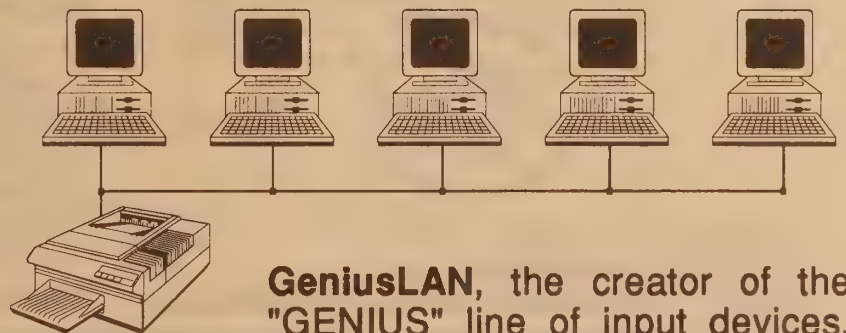

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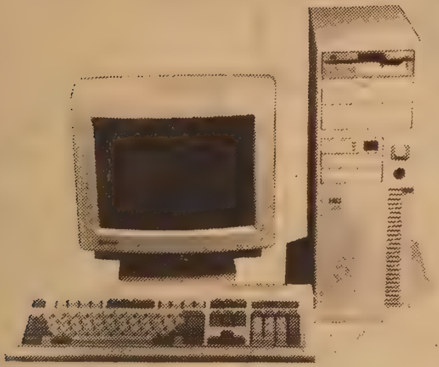

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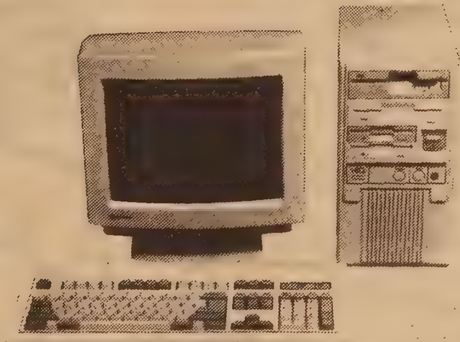

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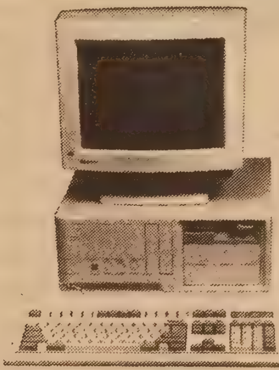

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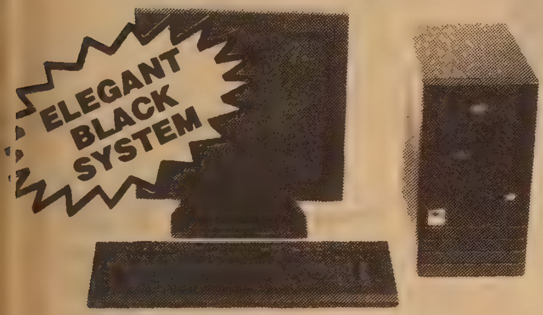

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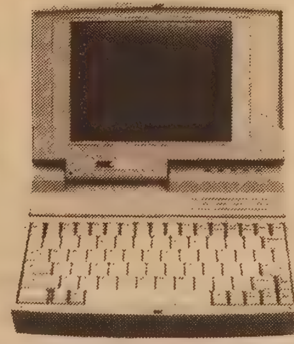

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The Virtual Art Studio

Fractal Design Painter For Windows

BY SUE ALBERT

At present, the much-hyped Virtual Reality means strapping on elaborate helmets, gloves, and other costly paraphernalia and connecting one's non-virtual self directly to a powerful computer. The resulting experience frequently amounts to little more than a 3-D animated comic book.

The Virtual Reality of the future may bring us Holodeck-style interactive beer commercials or deliver the ultimate educational tool, but graphic artists don't have to wait for big-time VR thrills. Right now, with a software program installed in a PC and connected to a touch-sensitive digitizing pad, they can propel themselves into a "virtual" art studio.

Fractal Design Painter is one of several powerful programs to break out of the Macintosh market and make for the greener fields of graphics-starved IBM users. It's going to bring more than a few serious PC artists into graphics territories now monopolized by the Macintosh.

This drawing was scanned from an original Pentel Brush Pen sketch I did around 1983 BC (Before Computer).

MAJOR BREAKTHROUGHS

The sensational effects and sheer scope of the product bowled me over...especially after I'd been bugging developers for years to add a natural drawing line and brush stroke to their art programs.

This is *not* your run-of-the-mill bitmap painting program. Fractal Design Painter isn't *like* drawing with pens, pencils, and brushes, Fractal Design Painter *is* drawing with those familiar tools—plus countless computer enhancements. This revolutionary software could "sell" PC systems the way Electronic Arts' Deluxe Paint software "sold" Amiga computers in the art community six years ago.

If you're a skilled artist, Fractal Design Painter will let you create or embellish work in familiar traditional media, push the envelope with special effects, make radical changes on the fly, and give your artwork the competitive edge with stylistic verve. If you're not so skilled, it will lend your work a slick professional polish. If you can't draw the proverbial straight line, you might still produce highly acceptable graphics by embellishing clip art or scans.

FOR PROFESSIONAL USE ONLY?

To balance the drool-factor, I should warn you up front that despite a relatively modest $399 list price, this software is greedy. It makes the notorious system demands of the requisite Microsoft Windows pale by comparison.

Fractal Design Painter needs, as a minimum configuration, 6MB of memory (you'll use every bit of it, and want/need 10–26MB more), a color monitor (Super VGA monitor with a 256-color or 32,768-color controller recommended, but it was designed for a 24-bit card), a hard drive (ideally with 20MB of free space). And be forewarned—this program is drive intensive. It supports a math coprocessor, and having one will greatly improve performance. Presently Fractal Design Painter only outputs to high-end color printers, but there are workarounds.

You can use an ordinary mouse with Fractal Design Painter, but you'll lose the sensitive response and variety of line textures you can achieve by using a pressure-sensitive pad. The Wacom Pad and CalComp Drawing Pad II are recommended, and the Kurta pad is mentioned in passing. Fractal Design Painter shows a bias toward

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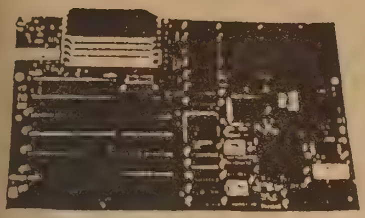

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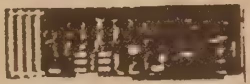

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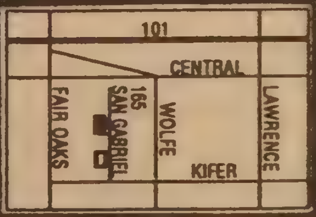

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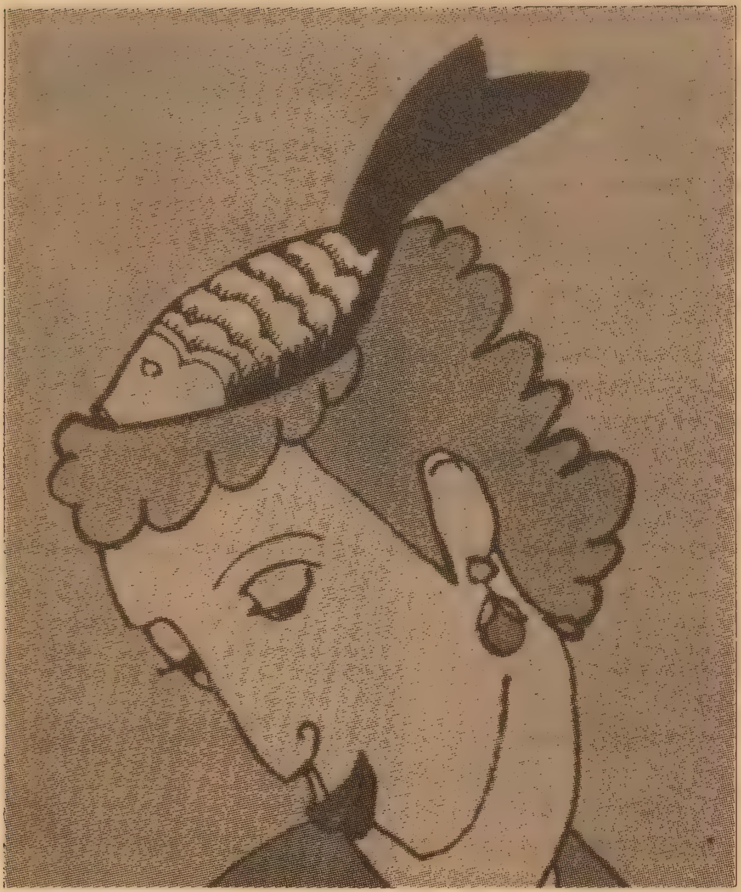


This is the scanned image after it was brought into Fractal Design Painter and "colored" with jewel tone blends and fills—something I was never able to do easily with earlier paint programs without messing up the original drawing.

the Wacom, which it automatically installs with directions for specific adjustments.

High-end system investments like this are not usually within a casual user's budget, but if you're making your living in computer graphics, client demands and the hot breath of the competition have already nibbled away at your sticker-shock threshold. Hard-ball players in the commercial art market need to carefully assess this software.

RESOURCES:

Fractal Design Corporation
(408)688-8800

Wacom
1-800-922-6613

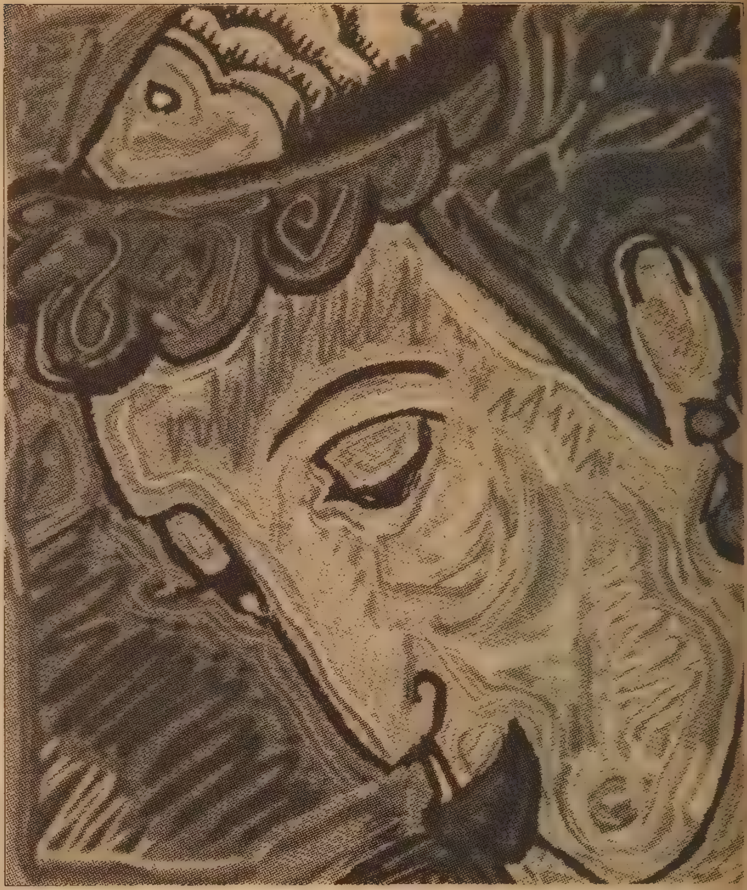
CalComp
1-800-932-1212

USING FRACTAL DESIGN PAINTER

Fractal Design Painter presents the merger of high-tech tool and artistic vision from the get-go. The gallon paint can used for packaging is lined with a designer poster and contains 5.25" and 3.5" disks, along with what appears to be a small sketchbook. This charming volume is a small information-rich manual that props handily in front of your monitor; it's filled with many small full-color samples illustrating textural and other image alterations resulting from the numerous combinations of menu settings.

When possible, the tools and terminology use metaphors close to those of the professional artist—e.g. the "frisket" menu and "frisket knife" icon. In a real-time art studio an Xacto knife is used to cut away areas from a removable gummed tissue (frisket) covering the background of an artwork so that it may be airbrushed or painted over without affecting the rest of the drawing. The Fractal Design Painter tools work the same way, even allowing for complex layering.

Other features are equally thorough. When new computer-aided techniques are introduced they are kept as logical and unobtrusive as possible. The program has such a natural feel that with practice you could almost forget the technology in the process of using the tools.



Here a detail has been "oil" painted using Fractal Design Painter's Van Gogh cloning brush.

I used a 486/50 with 8MB RAM, 300MB of hard drive storage controlled by a caching controller card, and a Diamond Stealth VRAM color card driving an Aamazing SVGA 14" monitor. I used evaluation units of both the Wacom SD 510C and CalComp Drawing Board II digitizing pads (see sidebar).

Flying without the manual, I plunged right into Fractal Design Painter after an uneventful installation. The main screen has a drawing window that is expandable to full-screen size, but it will be most convenient when sized to leave space for the variety of small expanding palettes, tool boxes, and adjustment windows that can be toggled on/off or layered according to your specific needs. A top-screen menu bar holds more modification elements and the necessary resolution, storage, and printing choices.

Intimidated but inspired by the available choices, I was soon immersed in brilliantly colored doodles and created a few modest sketches. The native format, .rif (for Raster Image File Format) saved my first small drawing in a whopping 502,766 bytes. Saving it as a .tif file was an even more costly 922,284; as a PCX file it was 827,423. Think removable media or other mass storage.

Working with the program was thrilling. My inexpensive SVGA monitor provided a beautiful image of features like the watercolor brush stroke, with intensified "pigment" along the edges and the transparency of the actual paint. When using virtual colored pencils, the built-up strokes realistically darken; chalk marks are dry and grainy-dusty on the edges; the air brush is like mist. Felt-tip pen colors alter appropriately when strokes cross. You can paint in oils and use randomized Van Gogh or Seurat-style brush strokes. I particularly like an ink line that thins when the stylus pressure is light and fast, then blots and thickens when the stylus pressure is increased and slowed. Different "media" also react to each other as they would in the physical world.

You are given a variety of application choices for each medium, such as fat, thin, and feather-tip airbrush strokes. When you experiment with the variant menus, the possibilities expand exponentially...to be further amplified when you add paper textures. You can apply a variety of surface textures that can include a light source and/or shine to the surface, and the medium can be set to react in a completely natural manner to the texture.

There are standard paper and canvas textures, and some delightful exotics. Even the standard surfaces can be magnified or changed to imitate stucco or other materials. You can paint over or scratch through fills or paint to reveal underlying texture for dazzling effects.

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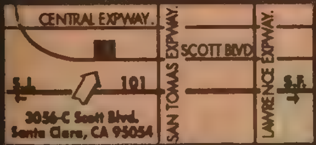

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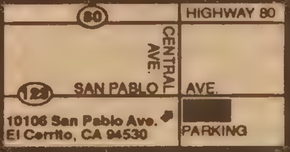

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486DX-33C EISA	848	1,018	1,278	1,408	1,458	1,528	1,578	1,738	1,788	1,938
486DX-50C ISA	838	998	1,258	1,388	1,438	1,508	1,558	1,718	1,768	1,918
486DX2-50C ISA	698	868	1,128	1,258	1,308	1,378	1,428	1,588	1,638	1,788
486DX-33C ISA	468	630	890	1,020	1,070	1,140	1,190	1,350	1,400	1,550
486SX-20C ISA	286	448	708	838	888	958	1,008	1,168	1,218	1,368
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386DX-33/64C	214	376	636	766	816	886	936	1,096	1,146	1,296
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386DX-25	174	340	600	730	780	850	900	1,060	1,110	1,260
386SX-25	124	290	550	680	730	800	850	1,010	1,060	1,210
386SX-16	102	270	530	660	710	780	830	990	1,040	1,190
286-20	72	232	492	622	672	742	792	972	1,022	1,172
286-16	68	228	488	618	668	738	788	968	1,018	1,168
286-12	56	218	478	608	658	728	776	958	1,008	1,158

BASIC SYSTEM CONFIGURATION:
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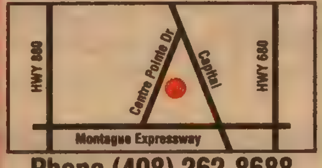

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tomatic methods of applying paint, etc. to an original drawing and scanned or clip art images. You can bring in an image from scanner or other source and copy it (clone is the FDP jargon.) You can then work over the image with the different cloning brushes that automatically conform to the underlying picture...or you can put a tracing paper screen over the image and keep only the strokes you want from the image...or you can let the computer automatically replicate the image in oils, watercolor, pen and ink, pencil, chalk, charcoal, airbrush, or custom brushes that you build.

Time is the limiting factor here. Some of these processes take big computer muscle and loads of time, comparable to working with 3-D graphics. Save autocloning on large images for last; have something to read, or go work on another machine.

ROOM FOR IMPROVEMENT

In its first Windows version, Fractal Design Painter has plenty of room for improvement and program tightening.

Take the printing function for instance. When I tried to print my first drawing from my QMS 410, I got only half a picture, with a heavy line on the top border. Though the print command appears in the file menu along with "Print Preview" and the Windows printer setup screen, there is no listing for Print in the manual's index and no mention in the manual text.

On the phone next day to tech support (my dime), I was told that Fractal Design Painter does not currently print to black-and-white laser printers because it was designed for output to high-end color printers. Detecting my audible gasp, the support person quickly informed me of a workaround—I could print from another application. It was hinted that remedies to this major oversight were being considered. Thereafter I saved my drawings as .tif files and printed them in black and white from Ventura Publisher or Corel Draw, losing few of the subtleties in the original color drawing. Printing also takes time, a small drawing took fifteen minutes.

There is a scarcity of on-screen status reports and error messages in the program to guide the user through unknown territory. It's no fun staring at an inactive screen while the computer is engaged in extended processing or drive activity and trying to decide if you've done something wrong or the software has crashed or entered an endless loop.

Other quibbles are of less significance but equal annoyance. In the Save menu, when a

Tactile Fractal: Digitizing Pads

The Dreama is a large, cordless, thin, light, very high-resolution, full-color screen that you could draw on directly, either in your lap or on an easel.

Right now the closest we can get is the pressure-sensitive digitizing pad. Here are evaluations of the two I tried with Fractal Design Painter.

WACOM SD-510C

The Wacom is well designed and a lovely performer. It is extremely sensitive and helps complete the illusion, with Fractal Design Painter, of working in the actual media.

It's about .25" thick and very light, with a 6" x 9" work area. It's connected by a slender cable to its own attractive 2" x 4" x 7.75" processing unit via a COM port. Installation, through the Windows setup screen, is relatively painless. It installs a Wacom control panel on your Windows program Manager screen for fine-tuning the pad and pen sensitivity.

The cordless stylus weighs less than many ball point pens, making it easy to use for long periods. It is sensitive to both pressure and speed, tracking your movements precisely. It comes with a small weighted pen stand. The pad's light weight and compact size make it ideal for use in your lap or propped in front of the keyboard.

There is also an optional cordless four-button cursor-mouse that can be used with your other software in lieu of a standard mouse. It is so light it feels empty, but requires a bit of practice since the sensors are to the front in crosshairs instead of under your palm like an ordinary mouse. It fits my hand well, but a male colleague with larger hands cursed the tightly clustered buttons and suggested that the crosshair sensor should retract into the body of the cursor for use as a conventional mouse.

The technical support for this product shines. From the 800 number I got rapid, friendly, and even interested response to my initial problem getting the pen to work in Windows extended mode. In a few days I received a beta version of a new driver that solved the problem.

Good customer service and good product design are undoubtedly costly, which may account for what I perceive as overpricing of this product. The SD-510 is Wacom's smallest pad (6" x 9" working surface) and costs a hefty $695 with the stylus, $795 with both stylus and cursor-mouse. As good as the Wacom pad is, it is only an input device and should be priced accordingly, especially in light of the larger PC market and plummeting system prices.

THE CALCOMP DRAWING BOARD II

The CalComp Drawing Board II is a lot more "social." Its LED winks constantly, and it clicks and chirps as it works. It is well constructed, but less sleek and heavier than the Wacom, because the processor is built into the board.

Installation was painless and the documentation adequate. You have the advantage of a much larger 12" x 12" work area; the cordless pen (also heavier because it contains a battery) has a very handy programmable button set at default to the "Enter" key. At the top of the pad is a row of pen-activated "buttons" that can be configured to trigger commands for individual software applications. This is a convenient feature that can free you from the keyboard while you're drawing.

The CalComp pad is less responsive than the Wacom. It requires more pressure on the pen; the tracking of pen movements seemed slower and less accurate than the Wacom's, which detracted from its use with Fractal Design Painter. I did not receive a mouse-cursor with the board to try with Corel Draw and other programs.

CalComp's 800 number also offers prompt, friendly, and helpful technical support. The price of the Calcomp Drawing Board II with the pen is listed at $645, with a street price significantly lower than the smaller Wacom. You would be wise to find a dealer who has both pads installed so you could do a side-by-side comparison based on your personal needs.

—Sue Albert

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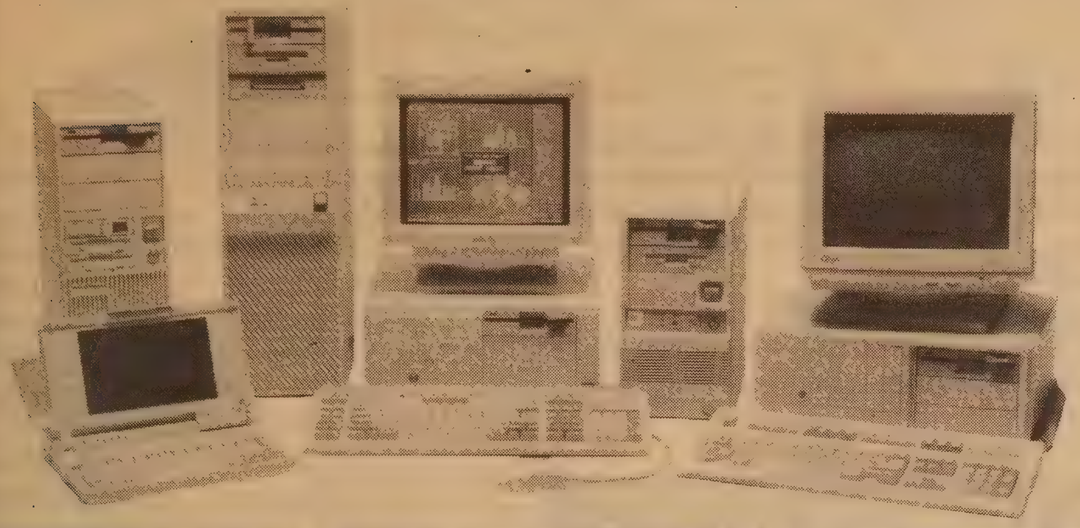

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format other than the default is selected, the entry line does not automatically change the extension. The manual has tutorials for only three of many sophisticated features. The documentation urgently needs either an interactive software tutorial or more written step-through directions. I found it startling that no example disk files are provided. At least one full-color scanned image and some before-and-after files to analyze would save a few hours of trial-and-error testing.

WHO NEEDS IT?

With good black-and-white output, Fractal Design Painter is not a feast reserved just for the commercial artist. As a desktop publisher I find the surface textures alone worth the package price. The possibilities of using unusual patterns to enrich the backgrounds of paragraph initials (big first letters) and to create original graphic ornaments are intriguing. A drawing-impaired desktop publisher could add client-pleasing touches by spicing up scanned and clip art images.

Fine artists are at considerable risk using Fractal Design Painter. The seduction of such a powerful tool could cause them to forget eating, sleeping, or socializing with animate beings. The price of an upscale computer system, while off-putting when compared to the cost of a few pieces of good paper and some watercolors, should be weighed against the ability to make endless changes and variations while working comfortably in a small, clean, and relatively nontoxic area. Tempting stuff!

HARDWARE: MORE IS MORE

If you decide to purchase Fractal Design Painter, the more you practice and use the software, the more complexities you'll discover and the more refined your results will be. To become "one" with the features so that you can work naturally in your own style requires some long hours of practice.

Have a hard talk with your financial decision-maker about the cost-effectiveness of working with sub-standard peripherals. My 14" monitor is adequate for personal use, but a non-interlaced 17" or larger monitor would bring out subtle details in the work area, cut down on time spent zooming in, and still leave room for the drawing and the tool windows. Constant scrolling is expensive in time and fatigue.

A 386 will do the job, but will considerably slow the production line without a math coprocessor. You must have adequate memory and available disk space for maximum efficiency. A pressure-sensitive pad is a professional necessity.

And then there's color. For magazine and advertising work, color output for comps is essential, but you could make do using a fast turnaround service bureau for final color output.

The whole area of color printing changes constantly—prices are dropping as the technology advances. Get what you need to get your job done, calculating the cost of supplies into the initial cost. Prepare to abandon it when superior technology appears. In the computer world it's the nature of the beast—but with software like Fractal Design Painter, it's "Beauty and the Beast." ■

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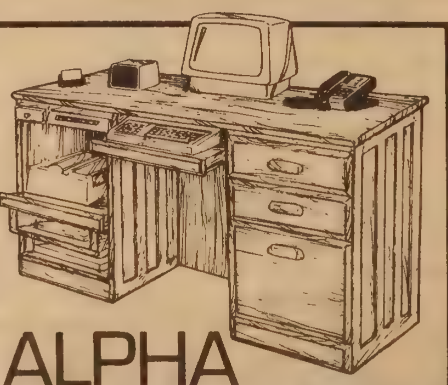

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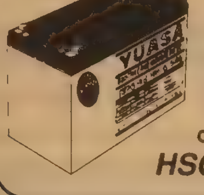


It doesn't take us long to sell out of these popular rechargeable batteries when we get a batch in, so stock up now! These Yuasa NP7-12 rechargeable lead-acid batteries rated at 12VDC, 7 amp/hours. New, '91 date codes. 2.5" x 4" x 6" with solderless quick connect tabs.

HSC#13123 ***$14.95 ea.***

Pocket-sized Ku-Band LNB...

...Not that you'd receive many satellite signals in your pocket, but this techno-marvel is that small! Measures only 4.5" overall length, with 1.5" square face. Noise figure of 1.2dB, Gain of 58dB, ready to attach to .75" x .375" rectangular waveguide for Ku-Band downlinks. We don't know operating voltage yet, but this info should be available. Manufactured by Norsat, Model# BSCA83H02

Brand New! ***HSC #KU-LNB $49.95***

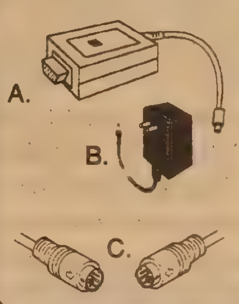
XT's from $65...AT's from $90

Just in!!! Large load of used IBM Compatible computer hardware... Too much to list. Stop by and check out our pile of XT's, AT's, & 386 Computers...Most of them booted from a floppy, a few had hard discs. All will need keyboards & monitors to complete the system, some will need other parts...

BUT ALL ARE PRICED TO SELL!!!

HURRY! **-- at these prices we expect them to go fast!**

Recycled Apple Bits...



A. Macintosh peripheral device adaptor converts older Mac 128 & 512 style peripherals (9-pin D conn.) to the Mac Plus and higher Mini-DIN connector. Requires 15-17 VAC input. (use "B" below)

HSC #13001 $5.95

B. AC adaptor 17VAC @ 750mA for use with above Mac device adaptor. Not the original one, will require you to put on a 3MM Coax plug to use.

HSC #12424 $3.95

3MM Coax plug, $.59

C. Mac Mini-DIN Cable...6-foot 8-pin Male to Male

HSC #13009 $3.95

Perestroika Fallout...
Soviet Science Collector's Item!

History on the march! Empires crumbling! Eager young scientists being trained for the new world order! We took advantage of the changing world scene to bring to you these unique items that also represent great value...Russian (formerly Soviet) microscopes! The manual calls them training microscopes, we would probably call them student-grade instruments, although they are not toys. They are biological (illuminated from below via mirror) microscopes with two objective lenses (8x, 20x) and three eyepieces (7x, 10x, 20x). The optical quality and workmanship are surprisingly good, given the stories we've heard of Soviet labor woes. The base and hinged armature are handsome painted cast aluminum, and the objective turret and lens bodies are chrome-plated brass. The only assembly required is to screw the eyepiece tube into the frame, and drop in your choice of eyepiece. These units are new, liberally greased (!), packed with a large sachet of dessicant in styrofoam & cardboard, and tied with string! The six-page manual is in fair English, and is duly rubber-stamped with several acceptance dates (1988) and certification numbers on the back. You can think of it as a piece of history, or just a decent, inexpensive microscope, only $69.95! Hurry, limited quantites!

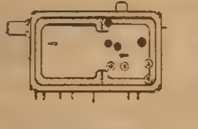
HSC #13065 ***$69.95***

An Electronic "Leash" and a Static "Watchdog"...

HSC is able to offer you two alarms that protect you in unusual ways...The first is the Sensor Aler at left... a pair of small units that are "tuned" to each other and like to be near one another! Separate them by more than 15 to 30 feet, the receiver beeps. Think of the uses! Put the transmitter on your small toddler at the shopping center, clip the receiver on your belt. If Junior wanders off...BEEP! Or put one on your car keys, you will never leave the room without them! The possibilities are endless. The receiver is only 2" x 2.75" x .5", and the transmitter is even smaller, only 1.5" x 2.25". Each unit uses three button cells (included). **HSC #13024 only $6.95/set.**

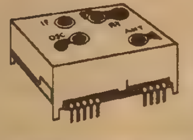
And if you don't have enough beeping going on in your neighborhood, the other alarm we are offering is our Static Charge Alarm, seen at right. This will alert you whenever it detects the presence of static electricity fields in its vicinity. This is important to know when working with MOSFET's, CMOS IC's, memory chips or other sensitive electronic components. Its also could be handy in the darkroom, as static discharges onto undeveloped negatives can show up on your prints. The unit will beep when one of three selectable levels of static charge is detected, allowing you to take preventive action. Only 4" tall, and uses a 9VDC 300mA adaptor (included) or a standard 9V battery (not included). Prevent shocking developments! **HSC #12846 only $4.95**

Teeny Tiny Tuner Modules



The unusual item at left is a MITSUMI CRTV9-AC55F 83 Channel Reverse Converter -- the opposite of a tuner - input IF signal (45.75 MHz) converted to one of 83 CATV signal frequencies (55.25MHz to 547.25MHz) selected by voltage input to varactor diode (3-24VDC). Requires +12,+5VDC-- Pinout, Spec. Sheet & Block Diagram included. Body Measures 3.75"x2"x.75". Useful for Amateur TV? Hams?

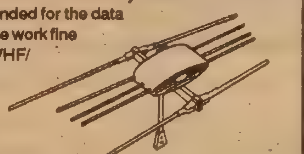
HSC #13120 $14.95



Here is a little module that you won't find anywhere else! This tiny (only 1" x 1.75" x .5") PC mount package is a varactor tuned FM tuner! Made by Toko (Model #TMC103A) for use on the PC FM Subcarrier adaptors above. Uses 8 - 12VDC, tunes from 88.3 to 108.1 MHz from 75 ohm antenna input, has 10.7 MHz IF output with Vco output for control feedback to tuning circuitry. We provide a schematic of a suggested application showing pinout of this module with related tuning circuit.

HSC #13101 $4.95 ea. or 10/$39.95

Broadcast FM Antennas



A. Winegard SR-8108 Yagi-type FM/VHF Antenna. Small mast-mount antenna appears to have been designed for attic or drop-ceiling applications, but we can't see any reason not to use it outdoors. 22.5" boom, longest element is 67". It was intended for the data receivers at right in fringe reception areas, but will of course work fine for FM Broadcast reception with your stereo, as well as VHF/TV reception! New with assembly and mounting instructions. ***HSC #13086 $19.95***

B. Dipole antenna (not shown). Typical 300-ohm stereo FM-type dipole antenna with built-in balun for 75-ohm coax, plus a six-foot coax cable with F-connectors. Works great with FM stereos, VHF TV's, or the units at right!

HSC #13087 $1.95ea. or 10/$15.00

C. FM "Rubber Ducky" Antenna ...18" long with pivot joint on mounting box, 75-ohm coax cable (6 foot) with "F" connector. Could be used in place of "D" above.

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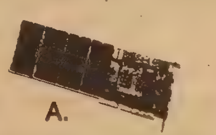
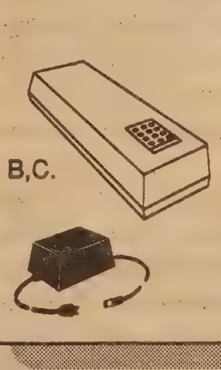
FM Computer Network Gear...

Just in...and it goes to show you what things you will find in Silicon Valley's surplus! We have come across a large quantity of components of a nationwide subscription computer network system...software, data and E-mail was sent by means of Broadcast FM Subcarrier and satellite! Perhaps another idea that was ahead of its time, who knows? Anyway, here is a rundown of the pieces, maybe you will think of something to do with them...Note: please don't contact the manufacturer, as they have moved on to other things!



A. "PIN-Desk" IBM/FM Subcarrier Receiver Board. Made by Indesys (similar to illustration). Full length XT style board has shielded box with FM tuner (frequency selected by software), piggyback board with either a 80C31 or two CY2901's. Comes with dipole antenna (see "B" at left) and two diskettes, one marked "Send" and one marked "Receive". This was intended to be part of an FM subcarrier subscription "network" for sending and receiving messages, files and data anywhere in the country! A hacker's bonanza with (depending on revision) NVSRAM's, MAX231, NSC800, Synthesized FM tuner, RF Parts, etc.!

HSC #13084 $24.95



B. "PIN-Mail" Reciever SA-287A, also made by Indesys. This was part of their "PIN" system, and you were supposed to be able to receive E-mail, unattended,via FM Subcarrier with just this box, an antenna (included) and a printer! Or it could be hooked up to a computer via parallel port. Box has numeric keypad on top, plus connectors on back for power, printer, computer and antenna. No diskettes (software is in ROM), just the receiver unit, dipole antenna and power supply.

HSC #13085 $24.95

C. Satellite Data Receiver ST-189, by Indesys. Externally similar to "C" above, but very different inside, unit was designed to be hooked to a small dish antenna and LNB (not included, and we don't have any!) for satellite reception of data and E-mail. Power Supply provided. Many interesting parts inside, including Z-80, NVSRAM, RF Linear parts, 80C31, Sierra Semi SC74008, tuner, etc. Experimenter's delight!

HSC#13100 $24.95

Attention Cable TV Station Operators!

For those with specialized CATV requirements, we just received a manufacturer's closeout of some new and used Catel Cable Television distribution gear. We have pallets of such things as Catel FMU Dual Channel Up-Converters, Catel OT 1010 Optical Transmitters, Tomco SM-2400 Synthesized TV Modulators, and much more! Too much to list here! Send SASE or FAX # for complete listing.

Terms: Some quantities limited; all items subject to prior sale. **Minimum order: $10.00 plus shipping.** Orders under $20.00 subject to $2.00 handling fee, plus shipping. All orders shipped FOB Santa Clara (this means you pay freight!) by UPS Surface (no P.O. Boxes) unless otherwise specified, in which case prevailing carrier rate plus $5.00 handling fee applies. Prepaid orders that don't include shipping will be shipped freight COD. If you have questions about your order, call Customer Service at (408) 732-1854 M-F 9AM to 5PM PST.

Continued from page 58

ket offices set in two long hallways at right angles to each other.

The radio technology generally employs "spread spectrum" technology that encodes the network signal and transmits small pieces of it over twenty or so different radio frequencies. The receiving antenna and radio gear automatically decode the signal, reassemble it, and feed it into the PC or the hard-wired network it serves. This "spread spectrum" approach provides a measure of data security against unauthorized tapping of the broadcast signal by those who don't have the technology to decode and reassemble it properly. It also ensures greater reliability of the radio link because some of the signal can be lost without compromising the integrity of the data transmitted.

Many network operating systems are already set up to disconnect and reconnect computers as they physically move in and out of the area served by the wireless links.

RESOURCES:

WaveLAN
NCR
1700 S. Patterson Blvd.
Dayton, OH 45479
(513)445-5554

Altair
Motorola Ardis
300 Ninth Bridge Pkwy.
Lincolnshire, IL 90069
(708)913-1215

PhotoLink
Photonics
200 E. Hacienda Ave.
Campbell, CA 95008
(408)370-3033

InterLAN
BICC Communications
103 Milburry St.
Auburn, MA 01501
(508)832-8650

Motorola's Altair system uses a central control module to support up to thirty-two network stations within range of its microwave radio signals. Each station has its own antenna, and can connect and disconnect without disturbing other links. Altair is compatible with standard networking methods, and provides a way to blanket as much as 5000 square feet of office space with a functional LAN.

Other wireless products, such as PhotoLink from Photonics and InfraLAN from BICC Communications, flood the indoor area with infrared light rather than radio waves—the same light used in most home TV, VCR, and stereo remote controllers. Infrared light is somewhat simpler to work with than radio because there are no FCC regulations to be concerned about, and because people are less fearful of infrared light than of microwave transmissions—neither of which, by the way, has been proved harmful in these small doses. However, the infrared systems are less able to send an adequate signal into areas around corners or behind walls, so that in certain office settings individuals in walled-in offices may be partially or completely cut off from the wireless LAN.

Nevertheless, dozens of network stations can be connected via infrared wireless in a central area, or even along narrow hallways. Some infrared systems require that all units "see" a central spot on the office ceiling against which the signal is bounced. An indicator light on the unit glows when the system is properly aligned. This approach makes it easy for several separate LANs to coexist in a single room, simply by arranging each station's infrared transceiver so that it aims at the desired one of several separate spots.

One technical problem with wireless LANs is the relatively low speed of present products compared with hard-wired networks. WaveLAN, for example, operates at 2MB, compared with 10MB for Ethernet on twisted pair wires. InfraLAN has been running at 4MB, but a newer version is rated at up to 16MB—more than enough speed for most office network applications. While scientific or industrial networks may in fact overtax the present capacities of wireless technology, the relatively low speed of indoor wireless links is something of a red herring. Few office LANs require anything even close to the maximum transmission capacity of standard hard-wired networks, and most wireless users report little if any performance degradation.

Wireless LANs have been demonstrated at recent Networld and other trade shows, and never fail to cause a sensation. The reason is simple: one of the biggest costs of operating a computer network is the time, trouble, and direct expense of rewiring every time a network station must be moved. Even if network wires are available in the new location, a technician's time is generally required to make the physical connection between the computer and the network. In larger organizations, people—and their computers—are constantly shuffling to and fro, creating a massive overhead expense that adds nothing to network efficiency or employee productivity.

Wireless technology is attractive precisely because it promises to reduce or eliminate this expense, and allow free-flowing communications between ad hoc workgroups whenever and wherever necessary. For example, Ron Wilson, of NCR WaveLAN, points out that wireless technology would have been very useful in Chicago during the recent epidemic of downtown basement flooding, when organizations were frantically trying to reorganize and reconstitute computer-based work groups in new, albeit temporary locations. Wireless-equipped PCs could simply have been placed in the new offices, and would have easily located each other and formed themselves into a data LAN.

Price is another problem for those contemplating indoor wireless networking. List prices have been in the range of $1500 per unit. In recent weeks, there are signs of them coming down to about $1000 per unit. Some vendors have begun aggressively pricing "starter kits" at $300–$400 for two or three network stations. Undoubtedly, increasing volume and advanced manufacturing technology will force prices to continue falling.

So how does wireless technology fit into an organization's networking strategy? Few if any experts suggest that existing wires be pulled out or disconnected and replaced with new wireless links. Instead, they suggest that network planners consider wireless for three applications: difficult-to-wire LANs, the "last 100 feet" of networks, and new LANs.

Wireless networking can already prove cost-effective for sites where wires are difficult, impractical, or impossible to run. In these applications, reduced performance is even less of a problem because the alternative to wireless links is generally to have no network at all. What's more, since many of these places—like loading docks and warehouses—are at the "front line" of business operations, wireless networking brings the added and incalculable potential for having a great deal more real-time data readily available to analysts and managers.

Wireless technology makes sense for many of the last links between an organization's data network and its end-users. In this approach, conventional network backbone lines and other data links remain in place, providing high-speed communications between buildings, work groups, major data resources, and other elements of the information system. However, end-users are given wireless links between their individual PCs and the rest of the network. This strategy provides greater flexibility for end-users and also eliminates most of the costs associated with moving individual network stations, yet it does not require a massive investment in reconfiguring network operations.

As prices plummet and performance increases, and as other vendors, such as Olivetti (already selling wireless products in Europe), Apple (exploring new radio frequencies for indoor wireless networking), and others enter the market, wireless LANs will begin to make a great deal of sense as alternatives to standard wired connections. This is particularly true as more and more people begin doing most of their computing on portable and laptop machines they regularly move from their office to the conference room to a colleague's office and back again. With a wireless LAN, virtually everyone can be part of the organization's data network without the costs or drawbacks of a physical connection. ■

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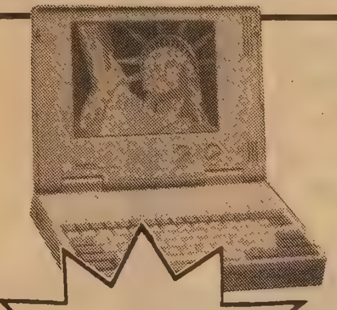

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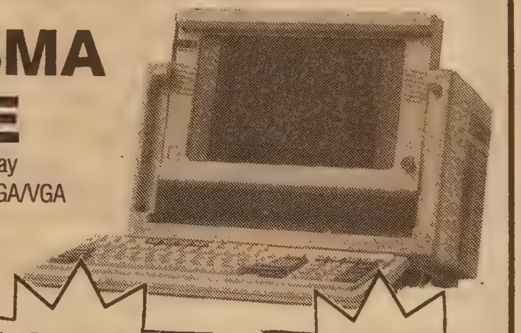

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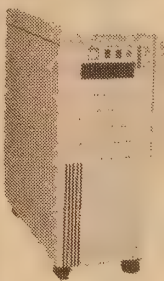

SE-AT-29

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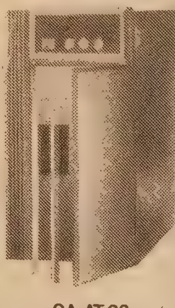

SA-AT-23

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486-50 MHz w/64K Cache	$1195
386-25 MHz	$430
386-25 SX w/32K Cache	$375
386-16 SX	$345
286-16 MHz	$295
286-12 MHz	$280

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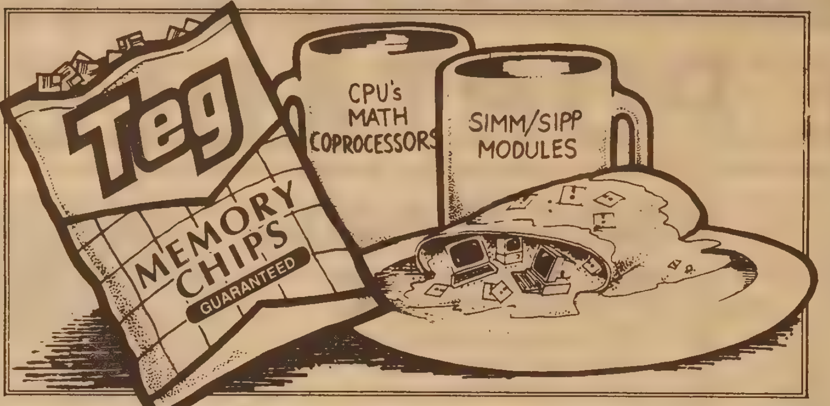

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1x8-80	33
1x8-100	32
256x9-60	12
256x9-70	11^{50}
256x9-80	11
256x9-100	10
256x8-80	9
256x8-100	9
4Mx9-80	130
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Continued from page 72

isolated the co-running applications from each other, I did not have to worry about interactions other than those I had created. Quattro and LINK each thought that they were running alone on their own computer. I never had to dive into the Quarterdeck manuals or call their technical support line. DESQview just worked, and it made the rest of the system possible.

THE IMPLICATIONS

You can put together your own DOS SuperApplications using the skills of different manufacturers to supply the components. By network and modem those integrated SuperApps can combine forces with others scattered around the world.

What I did only proves that the concept works. You can have many applications collaborating rather than just two. You can integrate a number of computers together, to make a *de facto* parallel-processing system from hardware you already have.

You can also let applications write scripts for each other. Since most "scripts," "macros," or "command files" are just lines of text, you can have one program write the script and deliver it to the other to execute. You can achieve security by delivering scripts to users only when they need to be run. The methods I used to get and paste stock prices into the Quattro spreadsheet can be used to get and paste a macro into a spreadsheet. Then the algorithms embedded in the macro are not in anyone's hands until they need to be used. Revisions can be current and self-installing. And you can let one application mastermind the loading and running of all the others in the multitasking environment.

That is the good news. The bad news is that you will still have to design the interface, and you must program each component to do its part. You will swear in the wee hours, I assure you.

But in the end you develop a customized product at a fraction of the from-scratch cost. Why spend tens of thousands of dollars developing a proprietary program when the elements of it are available for a tenth of that?

MORE TO COME

We intend to do the whole experiment again with Microsoft products, Windows and DDE, as soon as we get adequate hardware. Anybody have a big, fast, reliable harddisk they want to sell? ■

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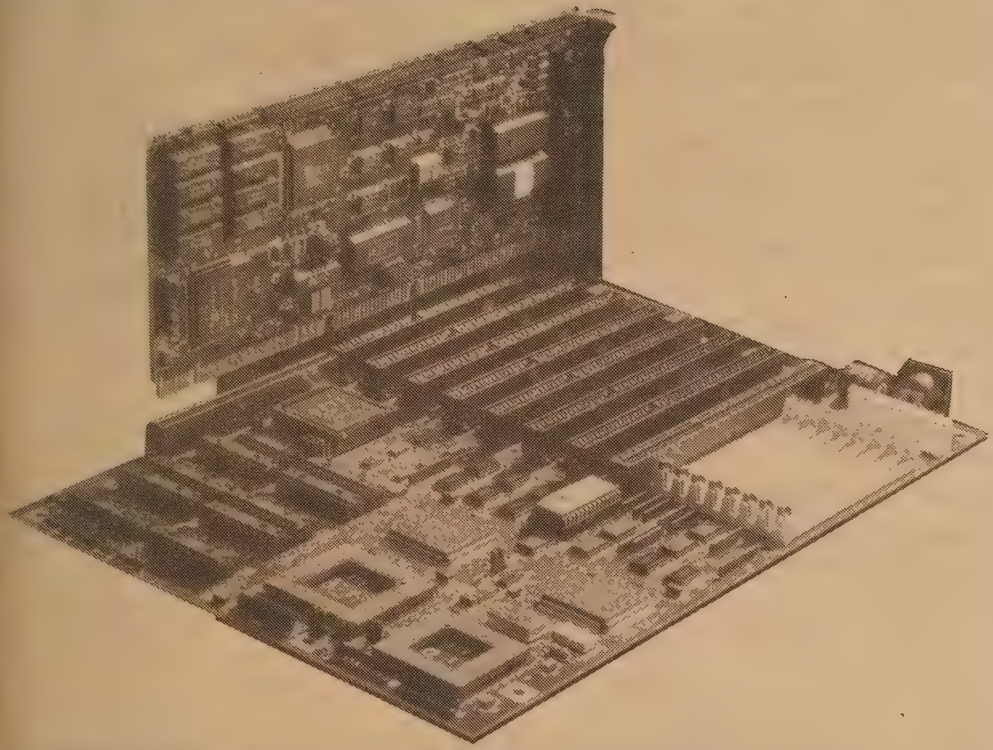

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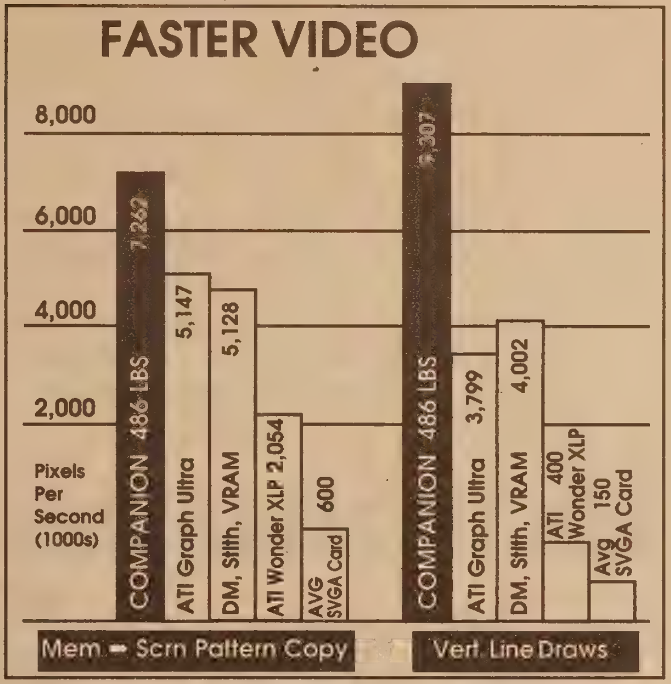

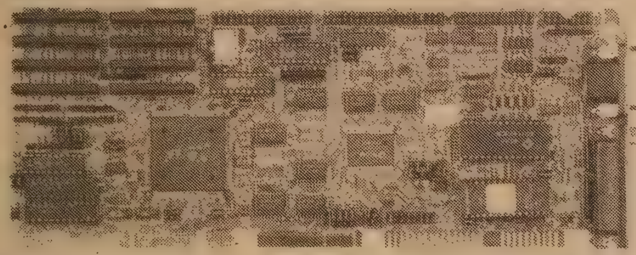

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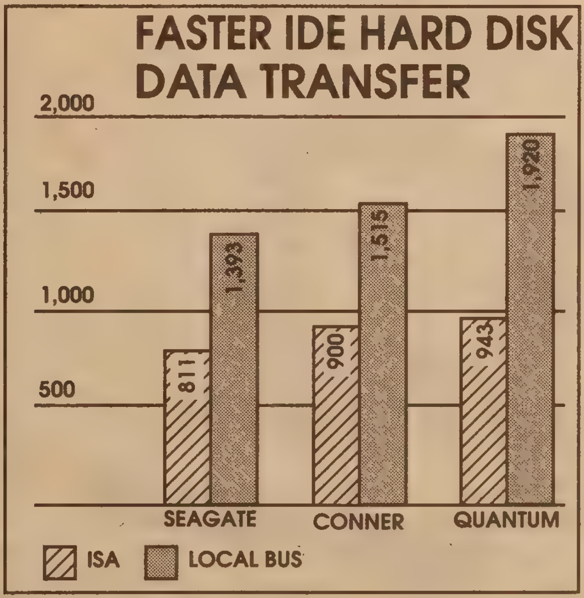

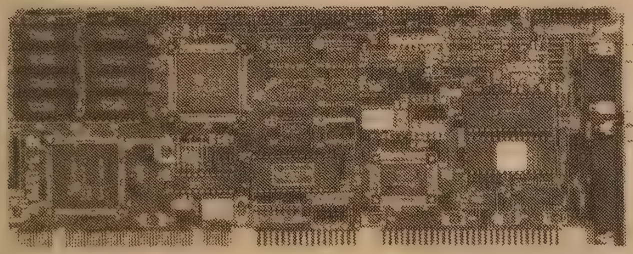

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Continued from page 122

individual CD-ROM databases. When the producers of these databases are asked about their high prices, they mumble about the small CD-ROM installed base, and recovery costs. DAK has gotten around this by bundling CD-ROMs in packages and offering these specially priced packages only to owners of their CD-ROM hardware units. DAK CD-ROM PAKs 1 and 2 illustrate the value of these packages.

CD-ROM PAK 1 consists of six CD-ROMs: Illustrated Encyclopedia, Library of the Future, New World Atlas 2.0, Reference Library (an eight-volume set), U.S. Atlas, and Languages of the World (which is actually reference dictionaries for twelve languages). As they say, if bought separately, the manufacturers suggested retail prices (MSRP) would total $1806. However, DAK charges $299, or an 83% mark-down from full retail price. The only difference I could find between the individual retail discs and the DAK PAK was in the packaging and the accompanying documentation.

DAK's second CD-ROM PAK consists of: Microsoft Small Business Consultant with Stack Pack, U.S. History, Magazine Rack, The Bible Library, and the Time Compact Almanac. The MSRP for these discs would total $1549. DAK charges $149—a 90% markdown.

I don't know how DAK negotiated such a deal, but everything worked as advertised. I reviewed the U.S. History CD-ROM for *MicroTimes* (issue no. 88, October 28, 1991). The only difference I found was in the packaging. It came in a plastic CD-ROM holder with a black-and-white minimal manual. The screened logo on the disk was different, as was the address for the Bureau of Development that had published the disc I reviewed. But the CD-ROM itself seemed to be the same. It had the same books, the same search software. To save 90%, I can certainly do without fancy spiral bound documentation and a big bookcase-size holder for both the CD-ROMs and the documentation.

When you purchase a DAK CD-ROM, the installation for the hardware also adds onto your disk a menu-driven CD-ROM launcher program. When you purchase a DAK bundle, it comes with update software for the original CD-ROM launcher program. It does not contain an original, since that only comes with the DAK hardware. Each bundle becomes a new menu screen in the launcher program.

When I first looked at these packages, I thought that perhaps these were not the same CD-ROM databases which were being sold separately for hundreds of dollars more. Well, I was wrong. These are the *same* CD-ROM databases which *are* still being sold individually for hundreds of dollars more. In fact, the savings are so significant, to my way of thinking, it might make sense to purchase the cheapest DAK CD-ROM player just to get access to their pricing on the CD-ROM disc bundles. ■

Accompanying your purchase of the DAK CD-ROM drive is Microsoft's Bookshelf CD-ROM library, as well as the Family Doctor and Front Page News CD-ROMs.

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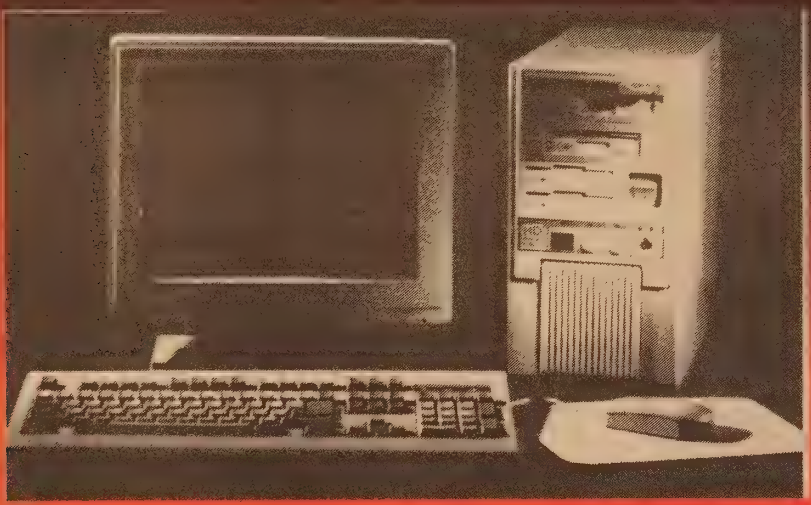

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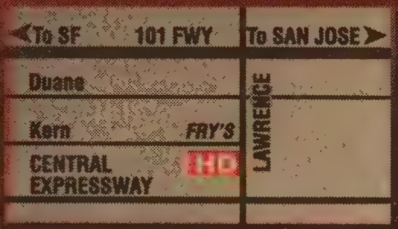

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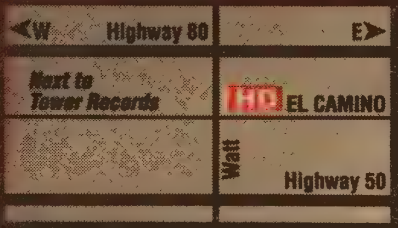

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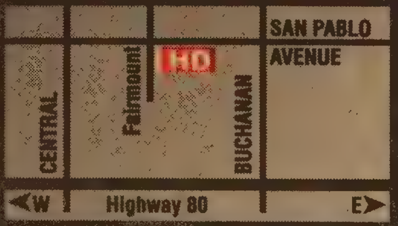

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Continued from page 132

```
G:\EXCEL>ssdir
Volume in Drive G is SSPARTSS.SWP
Directory of G:*.*

Filename          Filesize   Ratio    Date       Time
                  <DIR>      <DIR>    04-15-92   9:56 am
                  <DIR>      <DIR>    04-15-92   9:56 am
EXCEL.EXE         1254400    1.2:1    12-09-90   12:00 pm
EXCELHLP.HLP      1005344    1.9:1    12-09-90   12:00 pm
EXPENSES.XLS      24414      3.0:1    12-09-90   12:00 pm
FEATS.XLS         8265       4.0:1    02-19-92   10:41 am
PREV.FON          9936       3.2:1    12-09-90   12:00 pm
PREVIEW.XLM       149832     1.9:1    12-09-90   12:00 pm
README.TXT        12833      2.3:1    12-09-90   12:00 pm
TOTALS.XLS        3558       4.0:1    12-09-90   12:00 pm
TRANS.EXE         159168     1.8:1    12-09-90   12:00 pm
TRANS123.XLM      20763      2.1:1    12-09-90   12:00 pm
TRANSMP.XLM       18974      2.3:1    12-09-90   12:00 pm
LIBRARY           <DIR>      <DIR>    04-15-92   9:57 am
Total             2667487    1.5:1

14 File(s), 27705344 Bytes free, Bytes saved 933376
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June 7 Computer Show & Sale. Contra Costa Fairgrounds, Antioch. MarketPro. Call: (415)388-8893.

June 8 The Assembler Multitude: An Open Discussion Of New Technical Developments In Nanotechnology And Social Consequences And Dangers Of Nanotechnology. Palo Alto. Organized by: Ted Kaehler. Call: (408)974-6241. Email: Kaehler2@AppleLink.Apple.com.

June 8–10 Securing Your Networks Conference. San Antonio, TX. Computer Security Institute. Call: (415)905-2626.

June 8–10 SeniorFest '92: Citizenship In The Information Age Conference. Washington, D.C. SeniorNet. Call: (415)750-5030.

June 8–12 USENIX Summer 1992 Technical Conference. San Antonio, TX. USENIX Assoc. Call: (714)588-8649.

June 9 Intro To DOS Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

June 9–11 Leading The Transformation Of Information Systems Executive Retreat. San Francisco. Technology Transfer Institute. Call: (310)394-8305.

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June 9–11 Netucon '92: A NetWare Users Conference. San Jose. NCNUA. Call: (408)279-4155.

June 9–12 Intro To AutoCAD Seminar. San Francisco. SF State University Extended Education. Call: (415)338-1205.

June 9–16 MacroMind Director Class. San Francisco. Center for Electronic Art. Call: (415)882-7063.

June 10 Desktop Publishing With WordPerfect Class. San Rafael. Computer Training Center. Call: (415)459-3200.

June 10 Intermediate Paradox 3.5 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

June 10 Intro To Quattro Pro Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

June 10–11 Outsourcing Conference: Guidelines, Methodologies & Issues. San Francisco. DCI. Call: (508)470-3870.

June 10–July 1 Claris CAD Class. San Francisco. Center for Electronic Art. Call: (415)882-7063.

June 11 Intro To Paradox Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

June 11 Windows 3.1 Class. San Rafael. Computer Training Center. Call: (415)459-3200.

June 11–12 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

June 12 Advanced WordPerfect For DOS Class. San Rafael. Computer Training Center. Call: (415)459-3200.

June 12 Intro To Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

June 12 & 26 MacroMind Director Class. San Francisco. Abacus Training. Call: (415)759-2481.

June 13 Computer Show & Sale. San Francisco Cow Palace. Richard James Corp. Call: 1-800-533-7220. BBS: (415)464-6408.

June 13 Intro To Personal Computers Class. San Rafael. Computer Training Center. Call: (415)459-3200.

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This year's ComNet San Francisco is subtitled *High-Performance Network Strategies—The Broadband Era.* Eric A. Benhamou, president and CEO of 3Com Corp., will present the keynote address entitled, "Building Tomorrow's Networks Today." He will offer solutions as to how to overcome the "Complexity Crisis" that currently plagues the industry and will examine key issues to help you plan effectively for tomorrow's networks today. He will also discuss how 3Com has developed its own internal global data network and found the key to its cost-saving success. For more information, call: Matt Madino, World Expo Corp., 111 Speen St., P.O. Box 9107, Farmington, MA 01701-9107. 1-800-225-4698.

June 13–July 11 Object-Oriented Programming Overview Course. San Francisco. UC Berkeley Extension. Call: (510)642-4111.

June 14 Computer Show & Sale. Scottish Rite Center, Sacramento. MarketPro. Call: (415)388-8893.

June 15 Beginning DOS Class. San Rafael. Computer Training Center. Call: (415)459-3200.

June 16 Intermediate Lotus 1-2-3 For The Mac Class. San Francisco. Abacus Training. Call: (415)759-2481.

June 16 Intermediate WordPerfect For DOS Class. San Rafael. Computer Training Center. Call: (415)459-3200.

June 16 Word For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

June 16–18 AutoCAD 3D Features Course.

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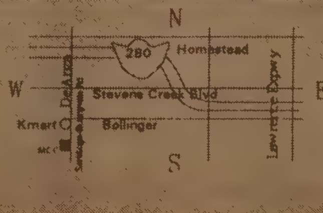

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Calendar Of Events continued

San Francisco. SF State University Extended Education. Call: (415)338-1205.

June 16–July 14 Intro To TCP/IP Course. San Francisco. UC Berkeley Extension. Call: (415)323-8141.

June 17 Beginning Lotus 1-2-3 For DOS Class. San Rafael. Computer Training Center. Call: (415)459-3200.

June 17 Beginning Windows 3.0 Class. San Ramon. MicroTek. Call: (510)831-8075.

June 17 Integrated Performance Support Systems Seminar. Pleasant Hill. Assoc. for Systems Management. Call: (510)658-4668

June 17 Intro To DOS Class. San Ramon. MicroTek. Call: (510)831-8075.

June 17–July 15 Integrated Services Digital Networks (ISDN) Course. Atherton. UC Berkeley Extension. Call: (415)323-8141.

June 18 Accounting Systems Seminar: Tax And Managerial Reporting. Oakland. David Simon, CPA. Call: (510)893-5753.

June 18 Advanced Paradox 3.5 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

June 18 Automation Solutions Seminar. San Francisco. PC-Optimizers. Call: (408)297-8731, ext. 361.

June 18 Beginning Word For Windows 2.0 Class. San Rafael. Computer Training Center. Call: (415)459-3200.

June 18 Intermediate WordPerfect 5.1 Class. San Ramon. MicroTek. Call: (510)831-8075.

June 18 Intro To Networks Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

June 18 NetWare Service And Support Seminar. Oakland. Informational Data Network. Call: (510)465-9084.

June 18–19 Project Planning Software Workshop. San Francisco. Symantec Training Group. Call: 1-800-786-8620.

June 19 Advanced Lotus 1-2-3 For DOS Class. San Rafael. Computer Training Center. Call: (415)459-3200.

June 19 Excel Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

June 19 Intermediate WordPerfect 5.1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

June 19 Quattro Pro Class, Part 1. San Ramon. MicroTek. Call: (510)831-8075.

June 20 Computer Mart. Cupertino. De Anza College. Call: (408)864-8350.

June 20 Computer Show & Sale. Solano County Fairgrounds, Vallejo. MarketPro. Call: (415)388-8893.

June 20 Computer Show & Sale. Santa Clara County Fairgrounds. Richard James Corp. Call: 1-800-533-7220. BBS: (415)464-6408.

June 20 Using MS-DOS 5.0 Shell Class. San Rafael. Computer Training Center. Call: (415)459-3200.

June 20 Video Design Principles Class. San Francisco. Center for Electronic Art. Call: (415)882-7063.

June 20 & 27 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

June 21 Computer Show. San Francisco. Ft. Mason Shows. Call: (916)725-0228.

June 21 Computer Show & Sale. Sonoma County Fairgrounds, Santa Rosa. MarketPro. Call: (415)388-8893.

June 21 Intermediate Microsoft Excel 3.0 For The Mac Class. San Francisco. Abacus Training. Call: (415)759-2481.

June 22 Paradox Class, Part 1. San Ramon. MicroTek. Call: (510)831-8075.

June 22 The Assembler Multitude: An Open Discussion Of New Technical Developments In Nanotechnology And Social Consequences And Dangers Of Nanotechnology. Palo Alto. Organized by: Ted Kaehler. Call: (408)974-6241. Email: Kaehler2@AppleLink.Apple.com

June 22 Wireless LAN Seminar. Oakland. Informational Data Network. Call: (510)465-9084.

June 22–24 X Windows Systems Level Workshop. San Francisco. UC Berkeley Extension. Call: (510)642-4111.

June 22–July 17 Intro To Music Synthesis And Programming Using NeXT Workstations Class. Palo Alto. Stanford University Dept. of Music. Call: (415)723-4971.

June 23 Basic Telecommunications Course. Menlo Park. UC Berkeley Extension. Call: (415)323-8141.

June 23–25 Digital World Conference & DemoCenter. Beverly Hills. Seybold Seminars. Call: 1-800-777-6650.

June 24 Intro To Windows 3.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

June 24 Word For Windows Class, Part 1. San Ramon. MicroTek. Call: (510)831-8075.

June 24–25 Basic Data Communications Course. Menlo Park. UC Berkeley Extension. Call: (415)323-8141.

June 25 WordPerfect For Windows Class. Walnut Creek. Computer Education Center.

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- Teac 1.44 MB 3.5" Floppy Drive
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Viewsonic 6	Non-Interlaced 1024x768 14" .28dp	395
Samsung Syncmaster 3	1024x768 14" .28dp	345
Sony 1604S	17" 1024x768	1095
Viewsonic 7	17" 1280x1024	1150
Viewsonic 8	20" 1280x1024	1695
NEC 4FG	Non-Interlaced 1024x768 15"	795
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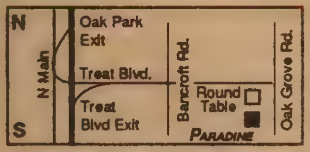

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Calendar Of Events continued

Call: (510)937-2566.

June 25–26 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

June 25–26 Q&A: Database/Word Processing Software Workshop. San Francisco. Symantec Training Group. Call: 1-800-786-8620.

June 25–26 Telecommunications Technologies For The Non-Engineering Professional Seminar. San Francisco. Data-Tech Institute. Call: (201)478-5400.

June 26 Advanced Quattro Pro Macros Class. San Rafael. Computer Training Center. Call: (415)459-3200.

June 26 Beginning Word 2.0 For Windows Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

June 26 WordPerfect Desktop Publishing Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

June 27 Comparing OS/2 v2.0 And Windows 3.1 Seminar. San Francisco. SFPC User Group. Call: (415)821-1310.

June 27 Computer Show & Sale. San Mateo Expo Center. Richard James Corp. Call: 1-800-533-7220. BBS: (415)464-6408.

June 27 Intro To DOS Seminar. San Francisco. SFPC User Group. Call: (415)821-1310.

June 27 Using Your Modem To Call A BBS Seminar. San Francisco. SFPC User Group. Call: (415)821-1310.

June 27 WordPerfect 5.1 For DOS Seminar. San Francisco. SFPC User Group. Call: (415)821-1310.

June 28 Computer Show & Sale. Centennial Hall, Hayward. MarketPro. Call: (415)388-8893.

June 29 Excel 3.0 Class, Part 1. San Ramon. MicroTek. Call: (510)831-8075.

June 29 Intro To Data Communications Seminar. Oakland. Informational Data Network. Call: (510)465-9084.

June 29 Managing Open Networks And Distributed Systems Course. Menlo Park. UC Berkeley Extension. Call: (415)323-8141.

June 30 Advanced WordPerfect For DOS Class. San Rafael. Computer Training Center. Call: (415)459-3200.

June 30 Intro To Macintosh Networks Class. San Jose. Abacus Training. Call: (415)759-2481.

June 30–July 21 Integrated Media Production I Class. San Francisco. Center for Electronic Art. Call: (415)882-7063.

JULY

July 1 Intro To The Macintosh System 7 Class. San Jose. Abacus Training. Call: (415)759-2481.

July 1 Lotus 1-2-3 Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

July 2 Intro To The Macintosh System 6 Class. San Jose. Abacus Training. Call: (415)759-2481.

July 6–10 International Conference On APL. St. Petersburg, Soviet Union. ACM, FinnAPL, & SIGAPL. Call: Lynne C. Shaw, (212)836-8644. Email: LynneShaw@mts.cc.wayne.edu.

July 6–17 Music Printing With Small Computers Class. Palo Alto. Stanford University Dept. of Music. Call: (415)723-4971.

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July 7 Intro To C/C++ Programming Class. San Francisco. Noe Valley Computers. Call: (415)824-1376.

July 7 Intro To Networks Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

July 7 Intro To Quattro Pro Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

July 7 Intro To The Macintosh System 7 Class. San Francisco. Abacus Training. Call: (415)759-2481.

July 7–10 Informix Worldwide Users Conference. San Jose. Informix Software. Call: 1-800-247-0262.

July 8 Intro To DOS Class. San Ramon. MicroTek. Call: (510)831-8075.

July 8 WordPerfect For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

July 9 Intro To Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

July 9 Lotus For Windows Class, Part 1. San Ramon. MicroTek. Call: (510)831-8075.

July 10 Beginning Paradox 3.5 Class. San Ramon. MicroTek. Call: (510)831-8075.

July 10 Intro To DOS Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

June 10 Networking For Writers Presentation. San Jose. California Writer's Club. Call: Arija M. Bottomley, (408)779-0222.

July 11 Build & Upgrade An IBM PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

July 11 Computer Show & Sale. Oakland Coliseum. Richard James Corp. Call: 1-800-533-7220. BBS: (415)464-6408.

July 12–17 Tenth National Conference On Artificial Intelligence. San Jose. AAAI. Call: (415)328-3123. Email: ncai@aaai.org.

July 13–14 Basic UNIX Systems Administration Course. San Francisco. UC Berkeley Extension. Call: (510)642-4111.

July 13–14 Mobile '92: A Technologic Conference. San Francisco. Technologic Partners. Call: (212)696-9330.

July 13–14 Project Planning Software Workshop. San Francisco. Symantec Training Group. Call: 1-800-786-8620.

July 16 Accounting Systems Seminar: Tax And Managerial Reporting. Oakland. David Simon, CPA. Call: (510)893-5753.

July 17 MacWrite Pro Class. San Jose. Abacus Training. Call: (415)759-2481.

July 18 Computer Mart. Cupertino. De Anza College. Call: (408)864-8350.

July 18 Computer Show & Sale. Santa Clara County Fairgrounds. Richard James Corp. Call: 1-800-533-7220. BBS: (415)464-6408.

July 20 Your Home Computer As A Learning Tool: A Workshop For Parents. Berkeley. UC Berkeley Extension. Call: (510)642-4111.

July 20–23 ComNet Conference & Exposition. San Francisco. World Expo Corp. Call: 1-800-225-4698.

July 20–23 Object World Expo And Conference. San Francisco. World Expo Corp. Call: 1-800-225-4698, (508)879-6700.

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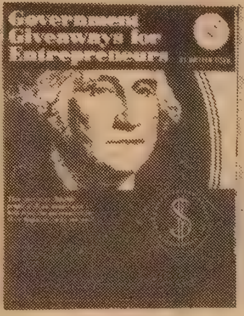

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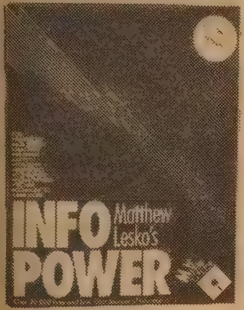

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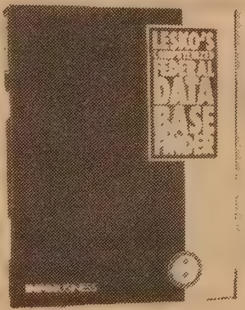

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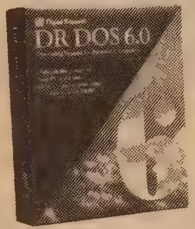

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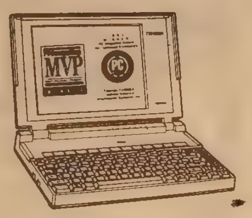

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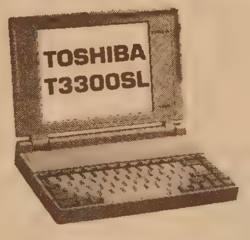

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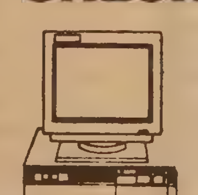

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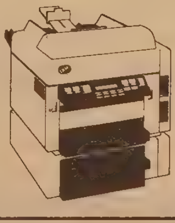

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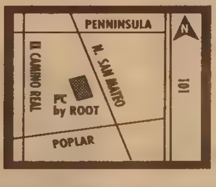

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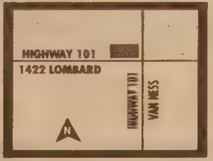

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July 23–24 Beginning 4th Dimension Class. San Jose. Abacus Training. Call: (415)759-2481.

July 23–24 PC Repair Workshop. Oakland Excel Micro Solutions. Call: (510)836-2040.

July 23–24 Q&A: Database/Word Processing Software Workshop. San Francisco Symantec Training Group. Call: 1-800-786-8620.

July 24 Beginning WordPerfect 5.1 Class. San Ramon. MicroTek. Call: (510)831-8075.

July 26–31 SIGGRAPH '92. Chicago. ACM Call: (312)321-6830. Email info92@siggraph.org.

July 29–30 HyperCard Stack Developmen Class. San Francisco. Abacus Training. Call (415)759-2481.

July 30 Paradox Class, Part 1. San Ramon MicroTek. Call: (510)831-8075.

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August 3–5 GroupWare '92 Conference And Exposition. San Jose. The Conference Group Call: 1-800-247-0262.

August 10–11 Project Planning Software Workshop. San Francisco. Symantec Training Group. Call: 1-800-786-8620.

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SELECTION: PC Magazine named the Super Cartridge 3/*Professional Edition* "the best scalable cartridge for the HP LaserJet III."* With IQE's high quality output, it's easy to see why. You can be creative with the *Creative Collection's* 22 great display faces like IQE Copperplate, Champs Élysées and Bodoni Poster plus 44 text fonts like IQE's Goudy OS, Letter Gothic and Souverin. The *Professional Edition+* essentially gives any HP LaserJet III family printer twice the number of typefaces available on most PostScript® printers, including equivalents for the 35 standard PostScript faces. With preferred serif faces like IQE's Schoolbook and Garamond OS, decorative fonts like English Blackletter and Chancellory, and scalable "fixed pitch" Prestige Elite and Courier, the *Professional Edition+* has an unequaled ASSORTMENT of typefaces. It even has small caps and old style figures—fonts not available on any other cartridge. And since each Super Cartridge 3 product has a unique selection of fonts, you can use both or pick the one that best suits your needs.

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BAY AREA BBSes

By Kathleen Creighton

What Is Usenet?

Usenet is a worldwide computer network generally supported by universities and computer companies running UNIX systems, a dull-as-dishwater description that doesn't do justice to Usenet's wide-ranging topic base. While most Usenet users are students, academicians, or technicians, larger numbers of "just plain folks" are gaining access through what are called "public access sites" (open to anyone, usually for a fee), or through echo gateways onto local BBSes.

Reading Usenet does not require a knowledge of UNIX, but venturing onto a public access Usenet site can be frightening without a road map, and the site can't be counted onto provide a clear manual or online menus, although some do. What follows is a simple overview, for people who have never read Usenet, of what Usenet is about and how to read it. It's not meant to be comprehensive.

Usenet topic areas are called "newsgroups," and reading Usenet requires the use of a "newsreader," usually a program executed by typing "rn" (readnews) or "nn" (no news) at the generic "what do I do now?" prompt. That's the easy part. Most new readers, however, are overwhelmed by what happens next—being presented with what seems like a never-ending list of all Usenet groups known to creation—or at least to that site. (Not all sites take all newsgroups.) But it's from this process of "subscribing" or "unsubscribing" to newsgroups that an individual account, tailored to the user's interests, is formed. This is a time-consuming process, but knowing in advance that it's required can help a new user plan when to take the time to do it.

Since most sites have a file with a list of newsgroups they carry, you can also check your manual (or ask your system administrator) to find out where the list of that site's newsgroups is kept and how to access it before you undertake setting up your account. The first part of a newsgroup name will give you some idea of the type of newsgroup it is. Most of the newsgroup names will give you the general idea of the focus of the group. The "comp" (computer) groups, of which there are many, are for serious discussion of some aspect of computing, while the "rec" (recreation) groups are largely general interest or hobby groups, such as rec.food.cooking or rec.pets.cats. There are many groups local to their own geographic area, but some non-local sites also receive them. In the Bay Area, you'll find "ba" groups, such as ba.market and ba.singles, and there are California ("ca") groups as well.

Most new readers probably oversubscribe to groups because their names all look so interesting, then unsubscribe when they find out that the group doesn't meet their expectations. You can always subscribe to an existing newsgroup later, and when new groups are introduced, you're automatically given the choice to subscribe or not.

Be sure to subscribe to news.announce.newusers because this is where you'll get the information about how to be a responsible "net citizen." Topics include Rules for Posting to Usenet, What is Usenet?, A Primer on How to Work With the Usenet Community, Hints on Writing Style for Usenet, Emily Postnews Answers Your Questions on Netiquette, and Answers to Frequently Asked Questions (FAQ). Although referred to as "rules," Usenet gestalt is largely a matter of convention. Deviance from those conventions will meet with swift retribution, either publicly or in your mailbox, or both.

Eventually you will want to know how to reply to an "article" (a Usenet message) publicly or through email, and how to use email to initiate private communication with someone else "on the net" (or with a net address) or respond to email you'll be getting. This means that you'll also have to adapt to the text editor or variety of editors the site has available, which will require use of the online or hard copy manual and lots of practice. And, lastly, a program called

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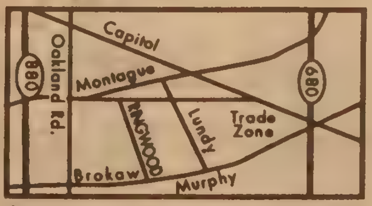

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Netcom Online Communications Services

Although there are a fair number of public access Usenet sites in the Bay Area (computers which carry Usenet and are available to the public), much of the cost of an account has to include toll charges unless you're lucky enough to be within the site's phone-company-imposed local calling area. Netcom is quickly carving out a niche as a flat-fee public access site which brings the site to the user with points of presence (POPs) in the 408, 415, and 510 area codes. (The San Francisco POP is in Alameda and is a toll call to those calling from western San Francisco. A POP to remedy this situation and to include at least southern Marin users is expected this summer.)

For those who have never been on a UNIX system before, "useful new user guide" might seem an oxymoron, but Netcom sends one to each account holder and support (via email) is available online, as are UNIX help screens. If you haven't seen a UNIX system before, the manual gives you enough information to try simple tasks to get around if you have to find your way on your own.

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His personality and presence were well known by everyone associated with the computer business in California.

His devotion to computers inspired him to start his own business, "PC By ROOT". Ivan began his business working out of his garage and in a few short years he developed it into a multi-million dollar company.

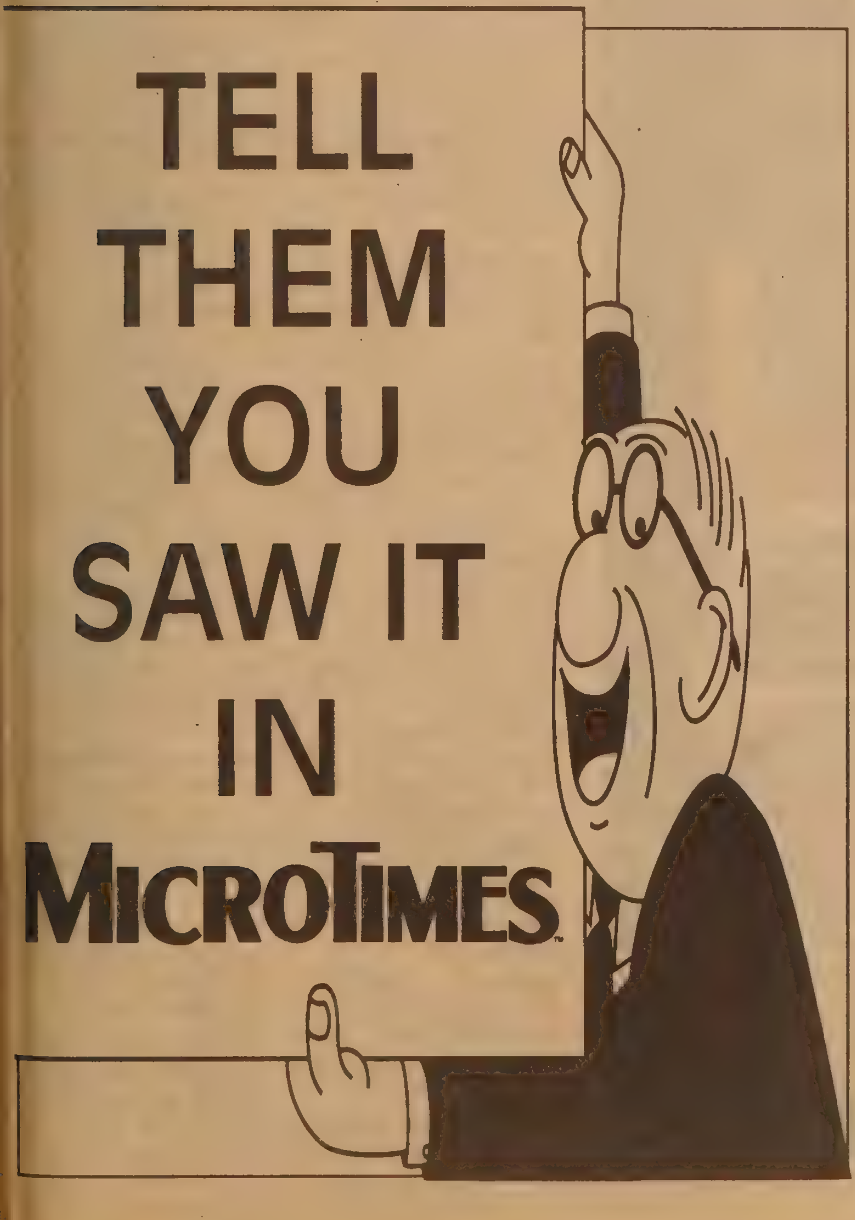
Ivan strived hard to keep honesty and integrity in the computer business and worked closely with many organizations to achieve these goals.

Ivan's appearance was well known at most of the California computer shows where his booth was well respected and patronized by hundreds of loyal customers.

The staff at "PC by ROOT" would like their customers to know that business will continue as usual in memory of their founder Ivan W. Root II.

Ivan's family and staff at PC by ROOT would like to thank everyone for their kindness and support during this emotional time.

Ivan's family and the staff at PC by ROOT would also like to thank BAM Publications for their kindness and generosity.



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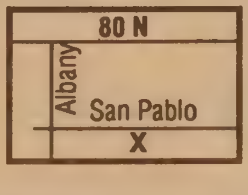

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80387SX-20	159.00
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80287XL/ XLT	109.00

Cyrix

Part #	Price
83S87-20	$149.00
83S87-25	159.00
83D87-25	179.00
83D87-33	189.00
83D87-40	219.00

Laptop Memory

TOSHIBA

	Memory Added	Price
T1000SE, XE,LE & 2000SX	1MBKit	$149.00
	2MB Kit	199.00
	4MB Kit	319.00
	8MB Kit	679.00
T1200XE	2MB Kit	119.00
T1600	2MB Kit	119.00
T3100SX	2MB Kit	119.00
	4MB Kit	209.00
T3100	2MB Kit	279.00
T3100e	2MB Kit	119.00
T3200/SXC	2MB Kit	119.00
	4MB Kit	209.00
T3200	2MB Kit	119.00
	4MB Kit	209.00
T3200	3MB Kit	229.00
T5100	2MB Kit	119.00
T5200, 5200C	2MB Kit	119.00
8500	8MB Kit	429.00

IBM

	Memory Added	Price
L40SX	2MB Mem.	$119.00
	4MB Mem.	219.00
	8MB Mem.	449.00

COMPAQ

	Memory Added	Price
Portable III	2MBKit	$129.00
Portable386/20	1MBKit	179.00
	4MBEXP	459.00
Portable LTE286	1MB BD	119.00
	2MB BD	149.00
	4MB BD	459.00
Portable LTE386S/20	1MB BD	179.00
	4MB BD	359.00
SLT/286	1MB BD	129.00
	4MB BD	429.00
SLT/386	1MB BD	139.00
	2MB BD	219.00
	4MB BD	399.00

NEC

	Memory Added	Price
UltraLite 286F	1MB MD	$229.00
	4MB MD	599.00
Prospeed SX/20	1MB BD	159.00
	4MB BD	439.00
Prospeed 286	1MB BD	139.00
386SX/16	2MB BD	259.00
	4MB BD	399.00
Prospeed 386	2MB CD	259.00
	8MB CD	999.00

ZENITH

	Memory Added	Price
S.S./SX	2MB Alpha	$169.00
	2MB Beta	169.00
	2MB EXP	189.00
Slimsport 286e	2MB CD	189.00
	4MB CD	429.00
Turbosport 386e	1MB BD	159.00
	4MB BD	495.00

OTHERS

	Memory Added	Price
AST Ext. Notebook	1MB SIMM	$79.00
	4MB SIMM	209.00
Sharp PC-6220 Notebook	1MB BD	139.00
Ti T.M. 2000	1MB BD	129.00
Ti T.M. 3000	2MB Kit	129.00
Everex Templ LX	2MB MD	199.00
Panasonic CF-170,270	1MB CD	129.00
Epson NB3S	1MB UPG	159.00
	4MB UPG	399.00

DeskTop Memory Upgrades

Apple

	Memory Added	Price
Mac Classic	1-3MB BD	$89.00
	2MB Kit	89.00
Mac IIci,IIsi	1MB Kit	69.00
Mac IIsi	2MB Kit	159.00
Mac Ici,IIsi	4MB Kit	209.00
Mac IIsi	8MB Kit	499.00
Mac IIci,IIsi	16MBKit	629.00
Mac IIfx	4MB Kit	199.00
	16MB Kit	699.00
Mac SE,SE 30, Plus, II, IIcx,IIx	4MB Kit	199.00

AST

	Memory Added	Price
Bravo 486/25	2MB Kit	$119.00
	8MB Kit	409.00
Prem 386/SX16 & 20, 25, 33	8MB Kit	409.00
Prem II SX/20	1MB Kit	59.00
SX/16	4MB Kit	219.00
Cupid Exp.	0K BD	269.00
Premium 386C	1MB Kit	59.00
WKST & Bravo	4MB Kit	189.00
Premium 286 Fastram	512-2MB BD	289.00
FastramKit	512 Upg.	55.00
Premium 386	1MB Kit	59.00
	4MB Kit	249.00

COMPAQ

	Memory Added	Price
DP 386/ 33,486/25,33 & Systemp	2MB MD	$119.00
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DP 386/ 20e,20 & 25e,25	1MB BD	139.00
	4MB BD	299.00
	1MB MD	89.00
	4MB MD	209.00
DP-386 S/16	1MB BD	119.00
	4MB BD	299.00
	1MB MD	89.00
	4MB MD	209.00
DP 286N, 386N, & 386SX/20	1MB MD	69.00
	2MB MD	109.00
	4MB MD	249.00
	0K BD	99.00
DP 386/16	1 MB BD	279.00
	4 MB BD	599.00
	8 MB BD	899.00

IBM

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55SX,65SX,55LS, 34F3077	4MB	239.00
70-A21,A61,B21, B61	2MB	119.00
30/286	2MB	99.00
PS/1	2MB	119.00
80-041	1MB	79.00
80-111,31	2MB	139.00
80-A21,A31,A61	4MB	239.00
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50 & 60	2MB BD	249.00
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	Memory Added	Price
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	2MB UPG. & Exp.	269.00
	2MB UPG. Kit	119.00
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	2MB UPG. Kit	149.00
P.M.386/20	2MB MD	349.00
	8MB MD	999.00
P.M.386/25S	2MB Kit	199.00
	8MB Kit	659.00
P.M.386/25	2MB MD	349.00
	8MB MD	859.00
	8MB Repl BD	1,199.00
P.M.386/33E&486/25E	2MB MD	279.00

ZENITH

	Memory Added	Price
Z-386/20, 25,33,33e	1MB SM	$ 69.00
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	4MB SM	259.00
Z-386SX, 286-LP+,Z-LS	2MB SM	119.00
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H.P.Laserjet II,IID	1MB Module	85.00
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	4MB Module	209.00
H.P.Laserjet IIIsi	1MB Module	69.00
	4MB Module	189.00
H.P.Deskjet	256K Module	109.00
IBM 4019,4019e	1MB Module	99.00
	2MB Module	139.00
	3.5MB Module	219.00
OKI Laser 400	1MB Module	109.00
	2MB Module	149.00
OKI Laser 800,820	1MB Module	109.00
	2MB Module	149.00
	4MB Module	199.00
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Panasonic 4420, 4450i	1MB Module	99.00
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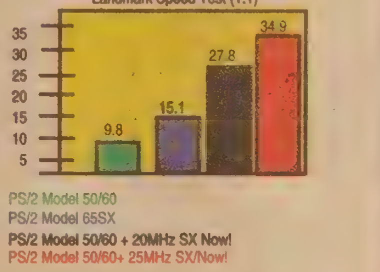

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Wrencher's Workbench. (510)357-0927. 8-N-1, 24 hrs., 300/1200/2400. Messages, files, advice on anything automotive—repairs to purchases. Sysop: Walther Boland. [Exp. #97.]

707

The Black Rose. (707)557-6444. 24 hrs., 300/1200/2400. All computers welcome. A new Commodore 64/128 BBS, running Image v1.2a. Sysop: Captain Keelhaul. [Exp. #97.]

Gridcom BBS. (707)746-8490. 8-N-1, 24 hrs., 14,400. Lrg adult section, LNet HQ. [Exp. #97.]

Public Domain Software Exchange. (707)444-9203. 8-N-1, 24 hrs., 1200/2400/9600. Multiple message areas, large file library, chat, four lines. [Exp. #98.]

Recommended BBS. (707)448-2225. 24 hrs., 300/1200/2400. Multiuser games, teleconference, conversational and technical areas, seven lines. All welcome. Sysop: Jay Parangalan. [Exp. #97.]

The South Pole BBS. (707)643-NBUG. 300/1200/2400. Sponsored by North Bay Users Group. Msg. areas, doors, files, matchmaker. Great for beginners. Sysop: The Penguin. [Exp. #97.]

UNIX Online. (707)792-0402, 795-1721. 24 hrs., Usenet access. For UNIX, Amiga, Mac, and DOS users. [Exp. #96.]

916

The Crow's Nest BBS. (916)925-7496. 8-N-1, 24 hrs., 300/1200. Commodore 64/128, Vic-20, Plus/4, C16, CP/M, and some PET support. Free. Sysop: John O'Neil. [Exp. #98.]

Leather First BBS. (916)974-1262, 362-4663. Sacramento's first leather BBS, reg. required, 18 yrs. or older. Sysop: Master Wade & Bob E. [Exp. #96.]

ASSOCIATIONS

American Association For Artificial Intelligence (AAAI). Call: (415)328-3123. Email: membership@aaai.org. [Exp. #100.]

Association For Women In Computing. Meetings: 1st Wed., 5:30 pm, San Francisco. Call: (415)979-8450. [Exp. #99.]

The Association For Worldwide Software Support Management. Meetings: 2nd Tues., Milpitas Sheraton. Call: Mikael Blaisdell, (415)865-1323. [Exp. #100.]

Association Of Database Developers (ADD). Meetings: 2nd Thurs., 7:00 pm, The Gatehouse, Fort Mason Center, San Francisco. Organization for professional xBASE language systems developers. Membership $50/yr or $5/meeting. Call: JoAnn, (415)863-6706. [Exp. #101.]

The Black Data Processing Associates, Silicon Valley Chapter. Meetings: 4th Thurs., 6:30 pm, Amdahl Corp., Sunnyvale. Call: Doug Jones, (408)737-5999. [Exp. #96.]

Computer Professionals For Social Responsibility. Meetings: 2nd Wed., 7:30 pm, UC Berkeley, Evans Hall, Rm. 608-7. Call: Judy Stern, (510)643-7499. [Exp. #101.]

Data Processing Management Association. Call: (415)978-0868. [Exp. #98.]

IEEE Computer Society, San Francisco Chapter. Meetings: 3rd Wed. Call: (415)905-4400. [Exp. #99.]

Independent Computer Consultants Association, Silicon Valley Chapter. Meetings: 4th Thurs., 6:00 pm. Meetings are open to all. Call: ICCA, (408)492-8888. [Exp. #96.]

International Computer Professional Association. An association for software professionals who want to work abroad. Call: Tony Rodriguez, (415)252-7467. [Exp. #98.]

International Network Of Women In Technology. Dedicated to significantly increasing the leadership of Women in Technology in industry and government. Call: Dr. Carolyn Turybfill, (415)336-1007. Email: Carolyn Turybfill@Eng.Sun.COM. [Exp. #97.]

Networkers' Toastmasters. Meetings: Every Tues., noon–1:00 pm, 2560 N. First St., San Jose. Call: Mona Kellem, (408)534-1255. [Exp. #98.]

North Bay Systems Professionals. Meetings: 3rd Wed., 7:00 pm, Holiday Inn, Terra Linda, 1010 Northgate Dr., San Rafael. NBSP provides a forum and network for system professionals. Call: Harry Chapman, (415)291-0174. [Exp. #101.]

Robotics Society Of America. Meetings: 2nd Mon., 8:00 pm, Exploratorium Library, San Francisco. Call: Brad Smallridge, (415)550-0588. [Exp. #101.]

SBEA (South Bay Entrepreneurs Association). Meetings: Twice weekly. Financial success and personal growth through teamwork. Call: (408)727-5950. BBS: (408)267-8325. [Exp. #96.]

Society For Technical Communication, Berkeley Chapter. Meetings: 2nd Wed., 6:00 pm, Yenching Restaurant, 2017 Shattuck Ave., Berkeley. Call: Rich Julius, (415)837-0397. [Exp #96.]

Society For Technical Communication, San Francisco Chapter. Meetings: 3rd Wed. Call: (415)985-7121. [Exp. #97.]

Software Entrepreneurs' Forum. Call: Barbara Cass, (415)854-7219. [Exp. #101.]

United Sysops Association. Meetings: 2nd Wed., 7:00 pm, Coco's, 1035 S. Mary Ave., Sunnyvale. Organization of bulletin board sysops and users. Call: Bill Strouse, (408)739-9081. [Exp. #101.]

Women's Computer Society. Meetings: Last Tues. Call: Tanya Halepota, (415)949-3936. [Exp. #98.]

USER GROUPS

ACCOUNTING SOFTWARE

Computer Associates User Group. Meetings: 1st month of quarter on 3rd Wednesdays. Holiday Inn, 1500 Van Ness. Come share ideas and information with other local users of Computer Associates Accounting Software! Call: Beth E. Markus, (415)864-6770. [Exp. #96.]

AMIGA

3rd Dimension—Image/Lightwave User Group. Meetings: 1st & 3rd Mon., Computer Showcase, 2739 Geary Blvd., SF. Call: Ollie, (415)863-8792. [Exp. #96.]

AAA—Amiga Addicts Anonymous. Meetings: 3rd Tues., Concord Water District Bldg., 1311 Concord Ave. Classes, BBS, pub. dom. disks, info line. Call: (510)935-0829. [Exp. #96.]

ACCESS—Amiga & Commodore Computer Enthusiasts Society. Meetings: 2nd Thurs., 7:00 pm, Livermore Airport Terminal. Call: Paul, (510)829-6053. [Exp. #98.]

ALF—Amiga Learners Forum. Meetings: 3rd Sun., 6:00 pm, Cupertino Library. Beginners group. Call: (408)262-9334. [Exp. #100.]

Amiga Nation. Meetings: 1st Tues., 7:30 pm, 324 Springs St., Suisun. Call: (707)421-2283. [Exp. #96.]

AWEST Amiga Users. Meetings: 1st Wed., 7:00 pm, Computer Showcase, 2739 Geary, SF. Call: (415)584-8406. [Exp. #96.]

FAUG—First Amiga User Group. Meetings: 1st Tues., 7:00 pm, HT Electronics, 275 N. Matilda Ave., Sunnyvale. Call: Mike Fisher, (415)855-9426, BBS (415)595-2479. [Exp. #100.]

TOGA—The Other Group Of Amigoids. Meetings: 4th Sat., 12:30 pm, Milpitas Library, 40 N. Milpitas Blvd. Call: Lawrence Brown, (408)984-6036. [Exp. #100.]

APL

APL Bay Area User Group. Meetings: 2nd Mon., 7:00 pm. Call: Tibor Horvath, (415)283-5611. [Exp. #100.]

APPLE

Tri-Valley Apple II User Group. Meetings: 1st Wed., 7:00 pm, Glendale Federal Bank, 3101 Crow Canyon Place, San Ramon. Come and learn more about your computer. Support II+, IIc, IIe, IIgs. Call: (510)828-0959. [Exp. #99.]

AT&T

AT&T Computer User Group, North Bay. Meetings: 1st Wed., informal discussion at 6:00 pm, program begins at 7:00 pm, San Francisco AT&T Bldg., 50 Fremont St. MS-DOS and UNIX. Call: Jim Lansing, (415)885-6631 or Joe Mahoney, (415)584-6510; BBS (415)829-6027. [Exp. #99.]

AT&T Computer User Group, South Bay. Meetings: 2nd Wed., informal discussion at 6:00 pm, program begins at 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. MS-DOS and UNIX Call: Joe Lipsig, (408)733-6522; BBS (408)946-7734. [Exp. #99.]

AT&T UNIX Computer User Group, South Bay. Meetings: 4th Wed., new user education at 6:30 pm, program begins at 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Thad Floryan, (408)985-7100; USENET, thad@cup.portal.com. [Exp. #99.]

ATARI

Bay Area Atari Users Group (BAAUG). Meetings: 1st Mon., 7:30 pm, Agnews Aud., 2nd fl., San Jose. Call: Joe Fischer, (408)988-3065. [Exp. #101.]

Santa Clara Atari User Group. Meetings: 2nd Wed., 7:00 pm, San Jose Computers Showroom, 1278 Alma Court, San Jose, near First and Alma. Call: Ron Reade, President, (408)225-7162. BBS:

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COMMODORE

64/More CUG, Cupertino Chapter. Meetings: 3rd Sun., 6:00 pm. Cupertino Library. Call: (408)262-9334. [Exp. #100.]

64/More CUG, North Valley Chapter. Meetings: 2nd Sat., 10:00 am. Milpitas Library. Call: (408)262-9334. [Exp. #100.]

ACCESS—Amiga & Commodore Computer Enthusiasts Society. Meetings: 2nd Thurs., 7:00 pm, Livermore Airport Terminal. Call: Paul, (510)829-6053. [Exp. #98.]

CAVE—Commodore Amiga Video Enthusiasts. Meetings: Every other Sat., 8:00 pm, 304 Springs St., Old Suisun. Call: Ron, (707)421-2283. [Exp. #96.]

Commodore Hayward User Group. Meetings: 2nd Sat., 2:00 pm, Palma Ceia Park. (510)793-2514. [Exp. #97.]

CWEST Commodore 64/128. Meetings: 3rd Wed., 7:00 pm, Fort Mason. For info: 1564 Waller #B, San Francisco, 94117. Call: (415)626-9946. BBS, (415)552-9320. [Exp. #96.]

CP/M

San Francisco Computer Society. Meetings: 7:00 pm, Laguna Honda School, 1350 7th Ave., San Francisco. Call: Ralph Gallegher, (415)929-0252. [Exp. #101.]

dBASE

ADD dBASE Software SIG. Meetings: 3rd Tues, 7:30 pm, Fort Mason Center, San Francisco. Led by Miriam Liskin. Call: JoAnn, (415)863-6706. [Exp. #101.]

ADD Fox Software SIG. Meetings: 1st Thurs., 7:00 pm, Fort Mason Center, San Francisco. Call: JoAnn, (415)863-6706. [Exp. #101.]

East Bay Database User Group. Meetings: 3rd Sun., 1:30 pm, 2415 Grant St., Berkeley. Call: David Chilcott, (510)653-1303. [Exp. #96.]

DESKTOP PUBLISHING

San Mateo County Ventura Publisher User Group. Meetings: 3rd Mon., 6:45 pm, San Mateo ROP, 1800 Rollins Rd., Rm. 14, Burlingame. Call: Elinor Cruze, (415)366-5317. [Exp. #99.]

FREEDOM, PRIVACY, AND TECHNOLOGY

BMUG SIG On Freedom, Privacy, And Technology. Meetings: Last Sun., 2:00 pm, BMUG office, 2055 Center St., Berkeley. Call: Judi Clark, (510)549-2684. [Exp. #100.]

IBM AND COMPATIBLES

Alameda Computer User Group. Meetings: 2nd Wed., 7:30 pm, Social Hall, Temple Israel, Island Dr. and Mecartney Rd. Providing an informal forum for both Macintosh and PC users to explore questions about hardware and software. Call: Dan Meyers, (510)521-3323. [Exp. #99.]

Berkeley PC User Group. Meetings: 2nd Mon., 7:00 pm, Winners Circle Systems, 2618 Telegraph Ave., Berkeley. Presentations followed by discussion, PD library, newsletter, Geo Ensemble SIG. Call: Mel Mann, (510)526-4033. [Exp. #101.]

Delta PC Users Group. Meetings: 3rd Sat., 10:00 am. Call: (510)427-2255, ext. 744. [Exp. #101.]

DVPC—Diablo Valley User Group. Meetings: 1st Thurs., 7:30 pm, Corondolet High School, corner of Treat Blvd. and Winton Ave., Concord. SIGs include WordPerfect, Windows, Paradox, Beginner's, Visual Basic, and a new education/entertainment group. Call: (510)943-1637. [Exp. #100.]

EastBay FOG. Meetings: 2nd Wed., 7:30 pm, Apostleship of the Sea, 600 Terminal St., Oakland. All microcomputers, MS-DOS, CP/M. Call: (415)272-9099. [Exp. #101.]

EPIC—EastBay PC IBM Computer Club. Meetings: 2nd Tues., 7:00 pm, Milpitas Library, 40 N. Milipitas Blvd. Beginners welcome. [Exp. #100.]

Golden Gate Computer Society (GGCS). Meetings: 4th Mon., 7:30 pm, San Rafael Community Center. Call: Steve Greenberg, (415)485-0136. [Exp. #99.]

IBM Technical SIG. Meetings: 2nd Thurs., 7:00 pm, Cubberley Community Center, 4000 Middlefield Rd., Rm. H-1, Palo Alto. Sponsored by Software Entrepreneurs' Forum. Call: Mike Schmit, (408)244-6826. [Exp. #98.]

Micromate-CP/M-DOS User Group. Meetings: 1st Thurs., 7:30 pm, Chabot Observatory, 4917 Mountain Blvd., Oakland. Call: Ed Miller, (510)376-1611. [Exp. #99.]

NBUG—North Bay User Group. Meetings: 2nd Thurs., 7:30 pm, 330 Rogers St., Vallejo. All computer users welcome. Call: (707)644-9327. BBS: (707)643-NBUG. [Exp. #100.]

PC BasicS: Silicon Valley Computer Society SIG. Meetings: 3rd Mon., 7:30 pm, 847 W. Maude Ave., Sunnyvale. Talks presented by Rich Wingerter of Zip Consulting & Design. Call: (415)326-2435. [Exp. #96.]

Peninsula Computer Club. Meetings: 2nd Thurs., 7:30 pm, Social Room, 222 Laurel St., San Carlos. DOS and CP/M libraries. Call: Larry Welling, (415)593-9981. BBS (415)571-9259. [Exp. #99.]

San Francisco Business Computers. Meetings: 4th Thurs., 5:30 pm. For those who use computers in business. Visitors $5. Call: (415)788-5338. [Exp. #100.]

San Francisco PC Users Group. Meetings: 3rd Tues., 6:15 pm, Conference Center, Bldg. A, Fort Mason. Call: (415)929-1993. [Exp. #101.]

South Bay WordPerfect User Group. Meetings: Monthly, dates vary. Saratoga Community Library. Free. Call: Martin Van Derpool, (408)238-8434. [Exp. #98.]

KNOWLEDGEMAN

Bay Area KnowledgeMan (And Guru) User Group. Meetings: 1st Tues., 6:30 pm., JNZ, Inc., 826 Las Trampas Rd., Lafayette. A forum for discussion and info concerning mdbs products, esp. KnowledgeMan and Guru. Call: (510)947-4878. [Exp. #101.]

LAPTOPS

HPX HP Laptops & Handhelds. Meetings: 2nd Sat., 10:30 am, Sunnyvale. Call: Michael Felsenstein, (415)564-8279. [Exp. #100.]

MACINTOSH

A32 Macintosh User Group. Meetings: 2nd Sat., 10:00 am, GTE Cafeteria, 100 Ferguson Dr., Mountain View. Call: (408)263-0398 days. [Exp. #97.]

BMUG—Berkeley Macintosh User Group. Meetings: Every Thurs., 6:00 pm, Physical Sciences Lecture Hall, UC Berkeley Campus. Call: (510)549-BMUG. [Exp. #101.]

BMUG West. Meetings: Last Mon., 6:30 pm, San Francisco Exploratorium. Call: (510)549-BMUG. [Exp. #101.]

International Macintosh Users Group (IMUG). Meetings: 3rd Thurs., 6:45 pm, location varies. A forum for multilingual computing. Call: Sachiko Berry, (408)862-7724 (weekdays). [Exp. #101.]

Let's Go Macintosh Computer Society. Meetings: 3rd Thurs., 7:00 pm, Skyline Jr. College, Media Center, Rm. 2105, San Bruno. See and try interesting new products, meet other Mac users, hear guest speakers. Call: Fidel Cajulao, (415)221-2995, or Nolan Apostle, (510)947-2523. [Exp. #100.]

Macintosh SIG. Meetings: 3rd Tues., 7:00 pm, Apple Cafeteria, City Center 4, De Anza and Rodrigues, Cupertino. Sponsored by Software Entrepreneurs' Forum. Call: Jeff Cherniss, (408)356-9901. [Exp. #98.]

SMUG (Stanford-Palo Alto Macintosh User Group). Meetings: 1st Mon., 7:00 pm, Syntex Conference Center, 3401 Hillview Ave., Palo Alto. Call: (415)328-4933. [Exp. #99.]

SPC Apple User Group. Meetings: 2nd Wed., 7:30 pm, Fremont Main Public Library. The Society for Prevention of Cruelty to Apple Computers Users Group supports all Apple and Macintosh computers. Call: Jim Weil, (415)796-7169. [Exp. #100.]

Women's Macintosh User Group. Meetings: 2nd Tues., 7:00 pm, ComputerWare, Palo Alto. Call: Buffy Joseph, (415)792-2840 or Tayna Halepota, (415)949-3936. [Exp. #96.]

MULTIMEDIA

BMUG Multimedia SIG. Meetings: 2nd Mon., 6:00 pm, Call: (510)549-BMUG. [Exp. #100.]

International Interactive Communications Society—IICS. Meetings: 2nd Wed., 7:30 pm, Call: IICS Hotline, (415)328-7318. [Exp. #96.]

Multimedia SIG. Meetings: 1st Thurs., 7:00 pm, Cubberley Community Center, 4000 Middlefield Rd., Palo Alto, Rm. H-1. SIG of Software Entrepreneurs' Forum. Call: Patrick Milligan, (408)257-1547. [Exp. #99.]

Multimedia User Group. Meetings: 1st Wed., 7:00 pm, 600 Townsend St., 1st Fl., San Francisco. A forum to learn about the multimedia industry, get your questions answered, and meet with fellow professionals. Sponsored in part by MacroMind/Paracomp/Authorware. [Exp. #99.]

MUSIC

MuSIG. Meetings: 1st Sun., 2:00 pm. Various locations. Based in Palo Alto. A network of people helping each other learn about computers and music: MIDI, hardware, software, performance, and programming. Call: (415)858-1493. AppleLink: UG0390. [Exp. #99.]

NETWORKING

NetSIG. Meetings: 4th Tues., 7:00 pm, Novell Sunnyvale. Networking SIG for Software Developers. SEF group. Call: Skip Addison, (408)747-4356. [Exp. #97.]

NEURAL NETWORKS

Neural Networks SIG. SIG for Neural Networks and its applications. Call: Kumar, (408)946-5835. [Exp. #98.]

NEXT

BANG—Bay Area NeXT Group. Meetings: 3rd Wed., 7:00 pm, Terman Aud., Stanford. Presentations and lectures. [Exp. #97.]

Berkeley NeXT Users Group. Meetings: 2nd Tues., 7:00 pm, 2055 Center St., Berkeley. Call: Bernt Wahl, (510)644-0139. [Exp. #98.]

NOVELL

Silicon Valley Novell User Group. Meetings: 3rd Wed., 6:30 pm, Coco's, 1305 S. Mary Ave., Sunnyvale. Call: Bill Strouse, (408)739-9081. BBS: (408)739-8753. [Exp. #99.]

OMNIS 7

GUIdata Bay Area Omnis 7 User Group. Meetings: 1st Mon. Newsletter, forum for all users. Call: Peter Bennett, (510)935-5203. [Exp. #101.]

PARADOX

Bay Area Paradox User Group—BAPALS. Meetings: 4th Tues., 4:00 pm, SF State University Downtown Campus. Forum for users and developers of all levels. Call: Patricia Hickey, (415)883-1020. [Exp. #96.]

PEN COMPUTING

Pen Systems SIG. Meetings: 4th Wed., 7:00 pm, Cubberley Community Center, Rm. H-1, 400 Middlefield Rd., Palo Alto. SIG of Software Entrepreneurs' Forum. Addresses all issues of interest for developers of pen computing software. Call: Bill McApline, (415)348-2257 or SEF at (415)854-7219. [Exp. #99.]

PROJECT MANAGEMENT

Microsoft Project User Group. Meetings: 3rd Mon., 6:30 pm, TEK/LINK Corp., 2901 Tasman Dr., Suite 207, Santa Clara. Project management solutions with Microsoft Project software—both PC and Mac. Call: Henry Viveiros, (408)293-5201. [Exp. #101.]

R:BASE

Peninsula R:Base User Group. Call: Don Whitecar, (415)592-5033. [Exp. #99.]

R:Base Users Group Of Oakland. Meetings: 2nd Thurs., even months, 9:00 am, 519 17th St., Downtown Oakland. Newsletter, tips & techniques, database design issues, and more. Call: (510)451-5316. [Exp. #97.]

SMALLTALK

Northbay Smalltalk/V User Group. Call: (415)362-4283. [Exp. #97.]

SQL

SQL_Forum/Bay Area SQL Database Server User Group. Meetings: Once a month in downtown SF. Oracle, SQL Server, SQLBase, and more. Call: Robert Gentry, DBBS, Inc. (415)583-3000. [Exp. #99.]

TELECOMMUNICATIONS

BMUG Telecom SIG. Meetings: Last Wed., 8:00 pm. How to use your modem, terminal programs, and the BMUG BBS. Call: (510)549-BMUG. [Exp. #101.]

TEXAS INSTRUMENTS

Santa Clara Valley TIPC Group. Meetings: 4th Thurs., 7:00 pm, Magnolia Inn, 176 S. Bernardo, Sunnyvale. Newsletter, library. Call: Thor, (415)386-5237. [Exp. #99.]

TI-99/4A. Meetings: 2nd Sat., Oakland. Call: Fred, (510)530-8335. [Exp. #100.]

THEOS

Theos User Group. Call: (510)785-7355. [Exp. #100.]

UNIX/XENIX

N. Cal UNIX Users. UNIX user group now forming: AT&T UNIX, Coherent, SCO UNIX/XENIX, and LINUX. Write: Just Computers, PO Box 355, Cotati, CA 94931. [Exp. #99.]

UNIX SIG. Meetings: 2nd Tues., DEC, 800 W. El Camino Real, Mountain View. Sponsored by Software Entrepreneurs' Forum. Call: Priscilla Rowe, (415)776-0513. [Exp. #98.]

VIDEO TOASTER

Video Toaster User Group. Meetings: Last Thurs., 7:00 pm, HT Electronics, 275 N. Mathilda Ave., Sunnyvale. Special guests, equipment demos, hands-on workshops, plus info/tips on new System 2.0. $4 for non-members. Call: Andrew Timmins, (408)244-9692. [Exp. #101.]

WINDOWS

WinSIG. Meetings: 3rd Thurs., 7:00 pm, Cubberley Community Center, Rm. H-1, 4000 Middlefield Rd., Palo Alto. Windows SIG of the Software Entrepreneurs' Forum. Call: Fran Finnegan, (415)929-7386, or Barbara Cass, (415)854-7219. [Exp. #97.]

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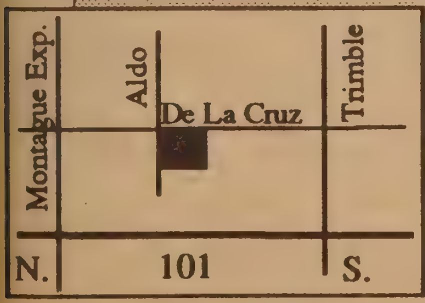

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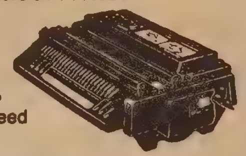

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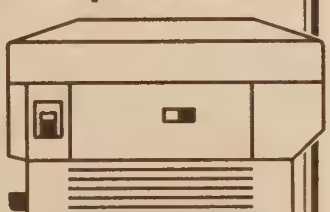

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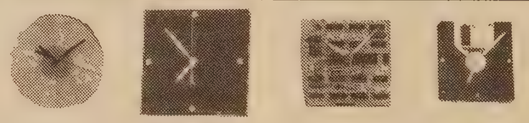

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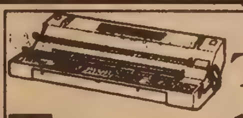

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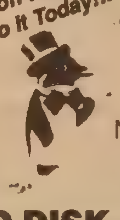

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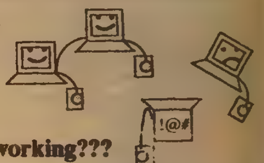

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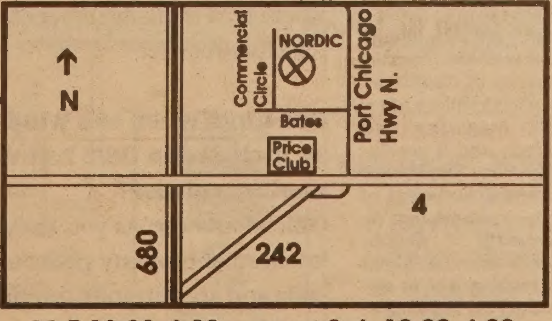

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Questions And Answers About OS/2

Real Questions, Official Answers, Real Answers (As I See Them, Anyway)

BY JOHN C. DVORAK

As a recent convert to OS/2, I've been downloading just about everything I can find concerning the new operating system. In the process I ran into this Questions and Answers file, posted as general OS/2 information on various electronic services. It's part of a question and answer session held by the company for the press and the OS/2 fanatics.

IBM has been criticized for its less than stunning marketing in the world of microcomputers. Of course, this is compared to Microsoft, one of the great marketing companies of all time.

Whatever the case, the company's Questions and Answers led me to imagine the McCarthy-Army Hearings of the 1950s, or even the Watergate hearings. The IBM responses to rather simple questions are pretty pathetic and wishy-washy. So I took the file and added the real answers (as I imagined them) after the official answer.

DVORAK'S LAST COLUMN

QUESTIONS & ANSWERS ABOUT OS/2

(Text released to the public on March 31, 1992)

© 1992 by John C. Dvorak. All rights reserved. John C. Dvorak graduated from the University of California. He is a contributing editor of PC Magazine and MacUser, and is considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.

Question: Can I walk into a local software retailer today and purchase OS/2 2.0?
Official Answer: Our goal is to make OS/2 2.0 available everywhere DOS is available and will be widely available on dealer shelves toward the end of April. If a customer's remarketer does not yet have the product in stock, it will be available through an 800# where IBM is taking direct orders.
Real Answer: *No.*

Question: When will Windows 3.1 code be included in OS/2 2.0? Will you issue another release?
Official Answer: As you know, we have the intellectual property rights to Windows 3.1 code and are currently running that code in our lab. We will review the final functionality of Windows 3.1 and base any feature updates on what our customers require.
Real Answer: *We have no idea.*

Question: IBM has always said it will not sacrifice product quality to meet a delivery date. Is today's product of the highest possible quality, or is it a buggy product that has been released to meet your set delivery date?
Official Answer: OS/2 is at a superior quality level. We believe we are delivering a world-class product to our customers, one which for the first time exploits the power of 32-bit Intel-based systems.
Real Answer: *We don't know. We just hope it works.*

Question: How many copies of OS/2 2.0 do you expect to sell by year end '92?
Official Answer: Currently, we have more than one million OS/2 licenses and each of those users will receive a free upgrade to OS/2 2.0. We expect to sell numbers in the millions.
Real Answer: *We haven't got a clue.*

Question: How is IBM planning to measure the success of OS/2 2.0 in the short-term? Long-term?
Official Answer: We use profitability, marketing share, and customer satisfaction.
Real Answer: *What kind of stupid question is that? Get a job!*

Question: How soon will you have another version or release of OS/2?
Official Answer: We do not anticipate that a new version of OS/2 will be required for some time. Rather, we will continue to enhance OS/2 2.0 over time by providing regular product enhancements.
Real Answer: *We haven't got a clue.*

Question: IBM must have invested heavily in the development of OS/2 2.0. How much did you spend?
Official Answer: Development costs are proprietary. If you're responding to the *WSJ* article, $2.5 billion was grossly exaggerated.
Real Answer: *Like we're going to tell anyone Give me a break.*

Question: Does IBM expect OS/2 2.0 t be a big revenue producer?
Official Answer: We believe OS/2 2.0 will be success in the marketplace.
Real Answer: *Duh! No, we do this as a hobb*

Question: How much are you spendin altogether in advertising/ promotion?
Official Answer: Our promotional budget i proprietary. However, let me emphasize tha we have established a far-reaching campaign In fact, it will be one of our largest worldwid ad investments for an IBM product this year
Real Answer: *We haven't got a clue.*

> **Question: How is IBM planning to measure the success of OS/2 2.0 in the short-term? Long-term?**
> **Official Answer: We use profitability, marketing share, and customer satisfaction.**
> **Real Answer:** *What kind of stupid question i that? Get a job!*

Question: Will you be doing any TV ad vertisements?
Official Answer: We have a hard-hitting prin effort planned; however, we are certainly ex ploring additional media.
Real Answer: *What? Are you nuts?*

Needless to say this goes on for days. I jus wish they'd use my answers. ■

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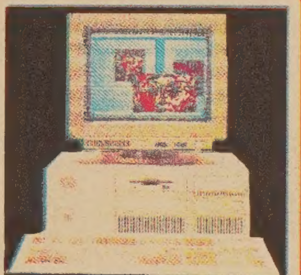

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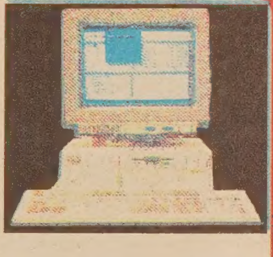

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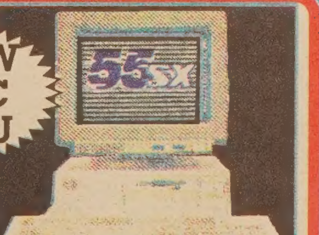

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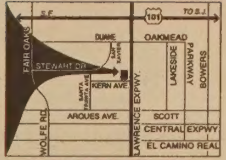

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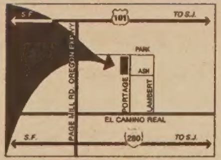

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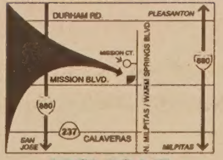

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The Power Behind the Best-running DOS and Windows Systems

It's an easy claim to make, but we have the facts to back it up:

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> "It's nothing less than a dream come true"
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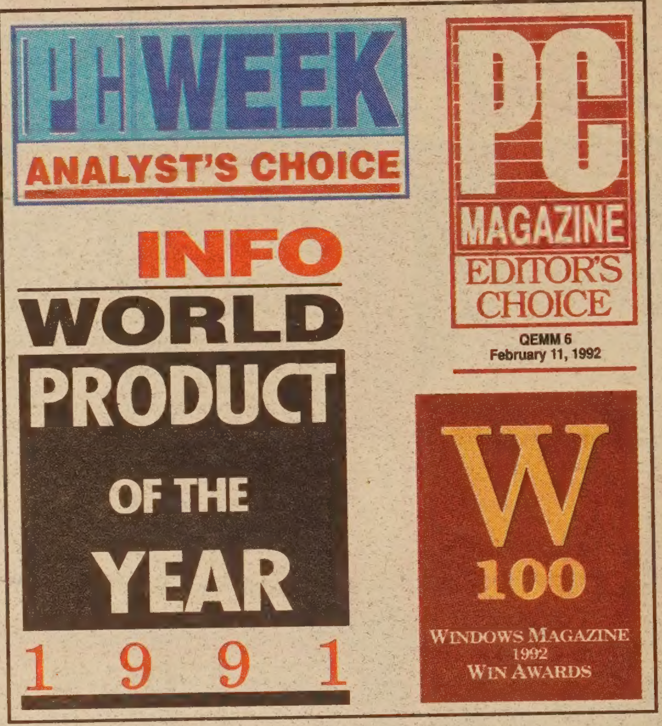
As for the all-important 'conventional' memory area, our new version 6 increases the amount of memory freed-up. Our exclusive 'optimize' feature automatically seeks out TSRs and device drivers and moves them into high memory—the area between 640K and 1 megabyte. All you need do is type 'OPTIMIZE'.

PC Week Ratings	All Charge 386 3.2	Netroom 2.10	QMAPS 2.0	386Max/ BlueMax 6.00	QEMM 6.01 Analyst's Choice	Memory Commander 2.1
Software Compatibility	◒	●	○	◒	●	◒
Hardware Compatibility	◒	●	◒	◒	●	◒
Reliability	○	◒	○	◒	●	○
Ease of Use	◒	●	◒	●	●	◒
Memory Management Flexibility	◒	●	◒	●	●	◒
Quality of Documentation	◒	◒	◒	●	◒	◒

● GOOD   ◒ SATISFACTORY   ○ NEEDS IMPROVEMENT

PC Week rated QEMM 6 the best memory manager.

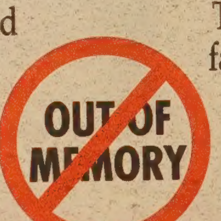


Our latest awards.

QEMM-386 v6 finds more high memory than any other memory manager. *Byte Magazine's* tests showed it produced net memory gains of 21K to 132K over DOS 5.0 alone, for instance.

Stealth takes you to network and TSR heaven.

Our breakthrough 'Stealth' technology makes available areas normally taken up by ROM. Areas that QEMM-386 can use to load memory-hogging drivers and TSRs. Big programs can get the memory they need to run fast and efficiently. And you get to have your TSRs.



Not every PC can benefit from Stealth. But every PC can benefit from *'Squeeze'*—our new feature to accommodate those TSRs that need more memory at start up and less when they're resident. Memory allocation is temporarily increased, then squeezed down after it's needed.

#1

QEMM is the number one selling PC utility.

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A priceless $60 bonus.

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Quarterdeck

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Key to comparison table: Software compatibility is defined as the product's ability to run without problems with the operating systems PC Week Labs used in testing, MS-DOS 5.0, IBM PC DOS 5.0 and Microsoft Windows 3.0, and with a variety of application software, including Quarterdeck's DESQview 2.40, Xerox Ventura Publisher 3.0 for DOS, WordPerfect 5.1 and Artisoft's LANtastic 4.0. Hardware compatibility is defined as the programs's ability to run on PC Week Lab's test hardware platform, which included a 33MHz 486-based PC and a 25MHz 386-based IBM PS/2 Model 70. Reliability ratings are based on the successful and dependable performance of each operating system and application-software package under each memory manager. Ease of use is based on ease of installing and configuring each program, based on support for automatic loading features and the intuitive narure of the interface. Flexibility in managing memory is rated on the range and quality of the product's features in optimizing system performance and handling special-case installation. Quality of documentation is judged by the clarity, comprehensiveness and helpfulness of the documentation provided with the product, based on the organization of the manuals as well as the thoroughness of definitions, directions and explanations, and the inclusion of troubleshooting information.

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